PET Model 4010
Voice Response Unit
User's Manual

commodore

PET Model 4010 Voice Response Unit User's Manual

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Section 1

INTRODUCTION

GENERAL INFORMATION

With the purchase of the Pet 4010 Voice Response Unit, you have added a new dimension of computer output devices. Vocal response from the Pet 4010 has a vocabulary which is limited only by your imagination. This manual contains basic information on your Voice Response Unit. Additional information on Voice Synthesis can be found in many reference material sources, some of which are listed in this Manual. To get the most out of your computer system, you should refer to other Commodore manuals.

DESCRIPTION

Your Pet 4010 Voice Response Unit utilizes principles of "phonetic speech sythesis." Most prior experience with speech output devices involves the playback of pre-recorded analog messages on a tape recorder, perhaps under computer control. Some more recent techniques involve digital recording and storage of speech in solid state memory elements and the reconstruction of that speech from the digital codes. Such techniques usually allow only a limited number of messages or a very limited vocabulary. The dynamic properties (intonation, rhythm, etc.) of human speech are difficult to reconstruct from digitally-stored words. Phonetic synthesis involves the generation and control of the basic speech sounds such that good quality speech with an unlimited vocabulary can be synthesized. These techniques allow the programmer to control the inflections, speed, dialect, pitch, stressed syllables, and dynamic transitions of speech.

"Phonemes" are the basic elements of speech—they are the sounds that are made by a certain position and movement of the lips, tongue, teeth, vocal cords, and other parts of the human vocal tract. "Speech sounds are comprised of consonants and vowels. Consonants are speech sounds that are characterized in enunciation by constriction or closure at one or more points in the breath channel. Vowels are speech sounds characterized by lack of any closure or constriction in the breath channel. Phonetics is the study of spoken language or speech sounds. It includes the systematic classification of spoken sounds according to the

way they are produced by the organs of speech and according to how they sound to the listener."†† *(Please see the References listed in this manual for more detailed information on speech synthesis.)*

The Pet Model 4010 Voice Response Unit recognizes sixty-three (63) phoneme commands together with four (4) different choices of inflection (pitch). Thus, it provides you with 252 unique synthesizer outputs (sounds) which you may program in any desired sequential order. As an example of the flexibility of phonetic synthesis; consider that there are $(252)^4$, or over 4 billion possible utterances programmable from the Pet keyboard, for just the words containing 4 phonemes alone.

The phonetic rules used as a basis for programming are based on the physiological aspects of human speech, the actual acoustic content of speech, *and* its perception by the listener. These phonetic rules do not necessarily correlate with dictionary phonetics, nor do they correlate with phonetics as usually taught in the elementary schools. Thus, the rules contained in this manual may appear somewhat alien to the beginner; but, once you become acquainted with them, determining the optimum programming for your individual preference in voicing for any word or phrase is really quite easy.

The Pet Model 4010 has been optimized for the speech sounds of "General American English." This is the language or native dialect of the majority of U.S. citizens. It is important that you adhere to the programming rules in this manual in your first attempts at programming. Then, changes can be made to better fit your preference of pronunciation, inflection, intonation, etc. Thus, individual dialects can be synthesized, if you prefer, after the basic construction of the synthesized speech is heard. You should, however, observe some caution in phonetic substitutions since what is acceptable to one listener may not be acceptable to the next. You should realize that your ear as well as your voice is trained to a dialect. Proper synthesized speech must take into account all subconscious or automatic articulatory habits as well as the rules of which we are consciously aware.

The International Phonetic Alphabet (IPA) is comprised of symbols which are assigned to speech sounds. This symbolic representation is independent of the language and is used to phonetically code the spoken form of language. Thus, the IPA system may be used to write a phonetic transcription which is a phoneme-by-phoneme representation of speech in any language or dialect.

Symbols of this type will be used to represent the phonemes accessible from the keyboard of the Pet Model 4010. Please refer to Section 3.0 for more details of phonetic programming.

APPLICATIONS

The applications of your Voice Response Unit are numerous, and examples may be found wherever a spoken response from your Pet Computer would be desirable. It has been recognized that human response to audio commands is often much quicker than response to visual commands. Thus, many aerospace warning systems use a spoken warning rather than warning lamps.

The Voice Response Unit can be programmed to speak columns of numbers for tabulation or verification purposes. It can also be programmed to give audio cues for errors during software development.

††Singh, S., and Singh, K. S.: *Phonetics Principles and Practice,* University Park Press, Baltimore, MD, 1976.

There are many applications for the Pet Model 4010 interfaced to a telephone. With a telephone interface, it is possible to have your computer provide you with output data over any remote telephone without the use of a printer. Imagine the numerous applications of such a system! Perhaps programs could be run by telephone remote control with the output spoken as it is computed. The computer might be "questioned" by a pushbutton input on the remote telephone.

Computer-aided instruction applications are also numerous. Teaching phonics is a natural application. Instruction by interaction with handicapped persons has been found to be an excellent use of the device. With voice response, it may be possible for a blind person to use the computer. The verbally-impaired person could also use the system as a means for verbal communication.

"Another natural application of speech output is to provide running commentary for complex screen displays, including animations. It can be unnatural and distracting to write such commentary on the screen."†† In this application, phonetic synthesis has a definite advantage over other techniques since it consumes such a small amount of computer capacity that it does not seriously limit the use of the screen graphics.

More advanced applications include text-to-speech systems and foreign language translation. As you become more familiar with your Voice Response Unit, you may want to experiment with algorithms for text-to-speech and/or for translation. These applications are complex ones and require a considerable application of language arts. Although the Voice Response Unit is optimized for the English language, other languages can also be spoken with some success using combinations of the available phonemes.

For larger, office computer systems, vocal response may be used for verification in word processing and for audio prompting as required.

INTERFACE

Interface to the Pet Computer is accomplished with the use of a PET-to-IEEE cable. An IEEE-488 connector is located on the back of the Pet Model 4010 Voice Response Unit. This connector is used with the cable to connect to the User's Port on the Pet.

An external audio output jack is located on the front panel. This jack accepts a standard ¼", 2-conductor phone plug. When the plug is inserted, the internal speaker is disconnected. The audio output at this jack is a low-impedance output that will drive audio loads from 4 to 16 ohms with up to 1 watt (RMS).

††Sherwood, Bruce A.: "The Computer Speaks", *IEEE Spectrum*, August, 1979.

SPECIFICATIONS

Physical

Cabinet	Vinyl-covered hardboard
Dimensions	12″ w. x 4″ h. x 6-3/16″ d. (30.5 cm w. x 10.2 cm h. x 15.7 cm d.)
Speaker	Internal, 4 ohms
Connectors	Cable connector for computer interface ¼″, 2-conductor phone jack Subminiature phone jack for transformer power
Controls	Volume On/Off

Electrical

Power	U.L. Listed Transformer	
	Transformer input	120 V, 60Hz, 15 watts
	Transformer output	12.5 V.A.C., 0.8 watts

Environmental

Storage/Shipping Temperature	–40°F to +160°F (–40°C to +70°C)
Operating Temperature	32°F to 110°F (0°C to 43.3°C)
Operating Humidity	0 to 95% with no condensation

UNPACKING YOUR VOICE RESPONSE UNIT

Before you unpack your Voice Response Unit, inspect the shipping carton for signs of damage. If it appears to be damaged, be especially careful when you inspect its contents. DON'T throw away any of the packaging material until you have located all the contents of the carton! The package should contain:

1. Commodore Pet Model 4010 Voice Response Unit
2. User Manual
3. Power Transformer
4. Demonstration Cassette

If any of the four items are missing or damaged, notify your Commodore dealer immediately.

Additionally, you must obtain the appropriate cable from your Commodore dealer to connect your Voice Response Unit to your computer.

Section 2

PREPARING TO USE YOUR VOICE RESPONSE UNIT

INITIAL PREPARATION

Turn the Volume Control to the OFF position. Insert the subminiature phone plug on the power transformer cord into the power jack located on the rear of the Voice Response Unit. Do *NOT* plug the transformer into an AC outlet at this time.

CONNECTING THE VOICE RESPONSE UNIT TO YOUR COMPUTER

A PET-to-IEEE cable, P/N 320202, is required to connect the Voice Response Unit to your computer. This is accomplished as follows:

1. Turn off the AC power to your computer.
2. Place the Voice Response Unit in a convenient location close to your computer.
3. Using needle-nose pliers, remove the connector key, if any, from the computer connector of the PET-to-IEEE cable.
4. Install the cable in the user port of the computer (see figure 2-1) with the Commodore logo facing *UP*.
5. Connect the other end of the cable to the Voice Response Unit.
6. Plug the power transformer on the Voice Response Unit into a standard 117 VAC, 60 Hz power outlet. *Do Not* turn on the power at this time.

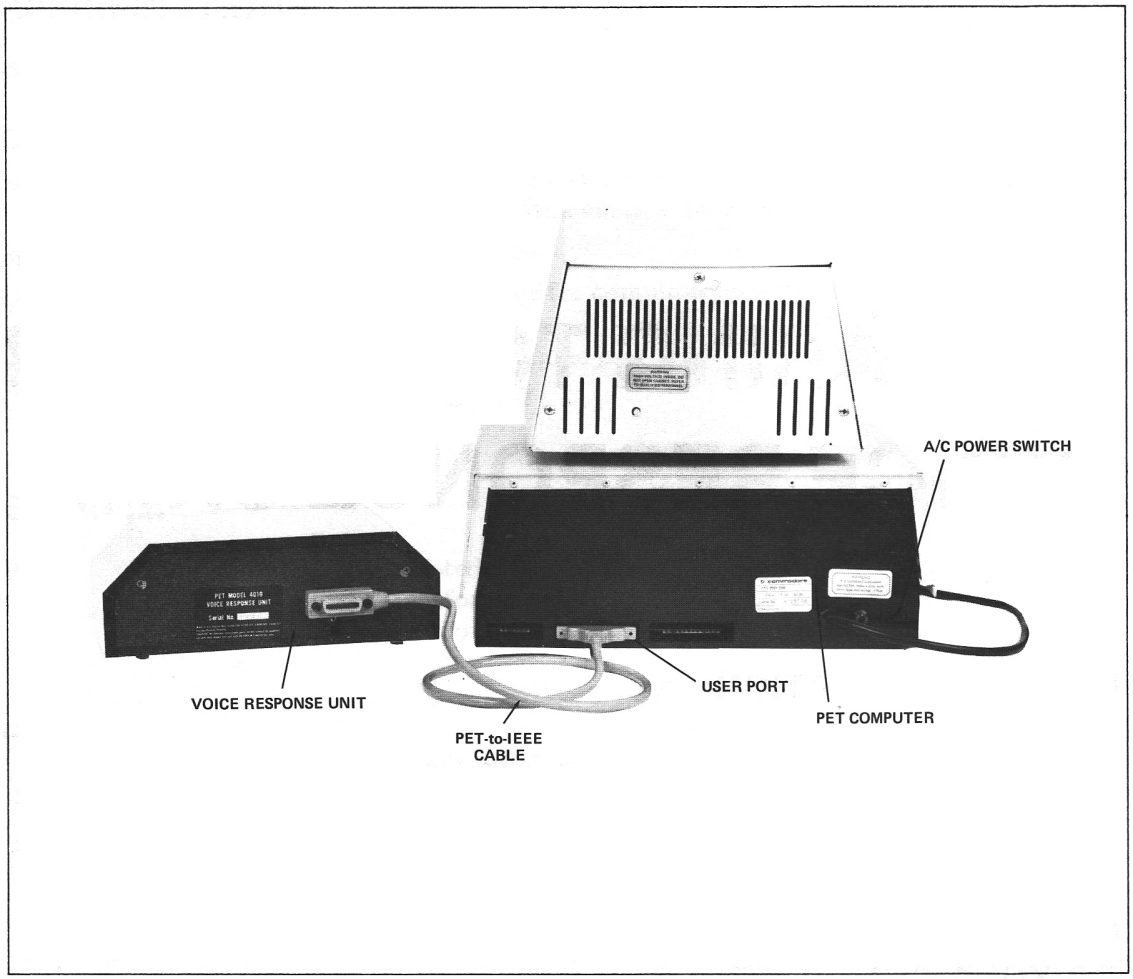

Figure 2-1. Voice Response Unit to Computer Hookup.

POWERING THE UNIT

You are now ready to proceed with the power-on part of the checkout:

1. Turn on the AC power to your computer and verify that it is working correctly.

2. To turn on the power to the Voice Response Unit, rotate the Volume Control clockwise. In response to the application of AC power, you may hear a steady tone from the Voice Response Unit. Load the demonstration cassette into the computer. When the program is running, the Voice Response Unit should speak in synchronization with the graphics on the screen.

Section 3

USING YOUR VOICE RESPONSE UNIT

SOFTWARE REQUIREMENTS

A sample program, "TALK", has been included to illustrate the initialization of and outputing to the Pet Model 4010 Voice Response Unit. A Program Description, Instructions, and Subroutine Map are included in the listing.

An example of teaching the 4010 to say "The United States of America" is as follows:

```
WORD #1? 2724
WORD #1? OK
WORD #2? 2U2N2;2&2T2!2D
WORD #2? OK
WORD #3? 2S2T2@2*2Y2T2S
WORD #3? OK
WORD #4? 262V
WORD #4? OK
WORD #5? 262M232R232K262space
WORD #5? OK
WORD #6? SAY ALL
```

```
10 REM "TALK" - DICTIONARY DEMO PROG
12 GOSUB 900:REM CLEAR SCREEN
14 PRINT "                T A L K "
16 PRINT "                ———————"
18 PRINT "THIS PROGRAM ALLOWS INPUT OF ";
20 PRINT "STRINGS    OF PHONEMES (WORDS";
22 PRINT ") REPRESENTED BY 64   ASCII ";
24 PRINT "CHARACTERS.  THE FOUR LEVELS ";
26 PRINT "OF   INFLECTION CONTROL (NUM";
28 PRINT "BERS 0-3) MAY BE HANDLED BY ";
30 PRINT "EITHER OF TWO METHODS:":PRINT:
32 PRINT "(1)  NUMBERS INSERTED BE"    ;
34 PRINT "TWEEN PHONEMES  OR"          :
36 PRINT "(2) π0,π1,π2 OR π3 INSERTED ";
38 PRINT "AT THE BE-     GINNING OF "  ;
40 PRINT "WORDS AND BETWEEN PHONEMES  ";
42 PRINT " TO DENOTE A CHANGE IN INFLEC";
44 PRINT "TION.":                   PRINT:
46 PRINT "FOR EXAMPLE:":            PRINT:
48 PRINT "'BE' = '3B1E1E' OR 'π3Bπ1EE'":PRINT:
50 PRINT "SEE REFERENCE MANUAL APPENDIX";
52 PRINT " II FOR    DICTIONARY.  NOTE:";
54 PRINT " TYPING 'GOSUB 3000'  PROVIDE";
56 PRINT "S A SUBROUTINE MAP.":   PRINT:
60 FOR J = 1 TO 1
62 PRINT "TYPE C TO CONTINUE";
64 INPUT J$
66 IF J$ <> "C" THEN J = J - 1
68 NEXT J
70 GOSUB 900:REM CLEAR THE SCREEN
80 PRINT "       I N S T R U C T I O N S:":PRINT "
85 PRINT "          PROMPT = 'WORD #X'":PRINT:
90 PRINT "   RESPONSE           ";
95 PRINT " RESULT":
100 PRINT:
105 PRINT "'PHONEME STRING'     ";
110 PRINT "4010 SAYS WORD":
115 PRINT "'OK'                 ";
120 PRINT "SAVES WORD":
125 PRINT "'R'             ";
130 PRINT "4010 REPEATS LAST OUTPUT":
135 PRINT "'SAY ALL'   ";
140 PRINT "4010 REPEATS ALL SAVED WORDS"
145 PRINT "'STOP'              ";
150 PRINT "TERMINATES PROGRAM"
155 PRINT:PRINT:
160 FOR J = 1 TO 1
165 PRINT "TYPE C TO CONTINUE";
170 INPUT J$
175 IF J$ <> "C"THEN J = J - 1
180 NEXT J
185 CLR :GOSUB 900:REM CLEAR PAGE
190 DIM S%(200):DIM A%(200):REM DIM ORAL STRINGS
195 REM SET 4010 ADDRESSES
200 DP = 59471:REM DATA PORT ADDRESS $E84F
205 CP = 59468:REM CONTROL PORT ADDRESS$E84C
210 RY = 59469:REM READY SIGNAL PORT $E84D
215 PA = 59457:REM CLEAR READY SIGNAL $E841
```

```
220 DD = 59459:REM DATA DIR REG $E843
225 GOSUB 700:REM INIT 4010
294 REM
295 REM MAIN ROUTINE
296 REM READS INPUT; CALLS OUTPUT
297 REM SUBROUTINES
298 REM
300 S%(0)=3:S%(1)=255:S%(2)=49:S%(3)=45:A%(0)=0
302 FOR G = 1 TO 200
305 X = 0
310 PRINT "WORD #";G;:INPUT SP$
315 IF SP$ = "OK" THEN GOSUB 360: X= 2
320 IF SP$= "R" THEN GOSUB 1000:X = 1
322 IF SP$ = "SAY ALL" THEN X = 1
325 IF SP$= "SAY ALL" AND G >1 THEN GOSUB 2000
330 IF SP$ = "STOP" THEN X = 3
335 IF X = 0 THEN GOSUB 2100: X = 1
340 IF X = 1 THEN G= G - 1
345 IF X <> 3 THEN                              NEXT G
350 END
360 J = A%(0)+1
363 FOR I = 1 TO S%(0)
365 A%(J) = S%(I):J=J+1
367 NEXT I
369 A%(0)=A%(0)+S%(0)
370 RETURN
396 REM ANNOTATED PHOMENE OUTPUT ROUTINE
397 REM PH: PHOMENE CHARACTER VALUE (0-63)
398 REM IN: IS INFLECTION VALUE(0-3)*64
400 REM ZZ = PEEK(PA) CLEAR READY SIGNAL
410 REM POKE DP,(PH AND 63) + IN WRITE DATA BYTE TO 4010
420 REM ZZ= PEEK(CP) READ CONTROL PORT TO SEND DATA READY TO 4010
430 REM POKE CP,ZZ AND 223 CLEAR BIT 5
440 REM POKE CP,ZZ OR 32 SET BIT 5
450 REM ZZ = TI + 300 SET MAX WAIT TIME
460 REM IF ZZ<TI THEN PRINT "4010 NOT WORKING":STOP
470 REM IF (PEEK(RY)AND 2) = 0 THEN 460 WAIT FOR READY SIGNAL
580 REM
596 REM PHONEME OUTPUT ROUTINE
597 REM SEE 396 FOR ANNOTATION
598 REM
600 ZZ=PEEK(PA):POKEDP,(PH AND 63)+IN
610 ZZ=PEEK(CP):POKECP,ZZ AND 223
620 POKECP,ZZOR32:ZZ=TI+300
630 IFZZ<TI THEN PRINT"4010 NOT WORKING":STOP
640 IF(PEEK(RY)AND2)=0 THEN 630
650 RETURN
695 REM
696 REM INIT ROUTINE FOR 4010 STARTUP
697 REM
700 POKE DD,255:REM SET DATA DIR REG TO ALL ONES
710 POKE CP,237:REM SET CONTROL & UPPER CASE SCREEN
720 GOSUB 800:REM SEND STOP TO 4010
730 RETURN
794 REM
795 REM STOP ALL 4010 OUTPUT
796 REM
800 PH = ASC("-"): GOSUB 600
810 RETURN
895 REM
```

```
896 REM CLEAR SCREEN
897 REM
900 PRINT "□"
910 RETURN
994 REM
995 OUTPUT A STRING OF PHOMENES
996 REM
1000 FOR I = 1 TO S%(0)
1020 IF S%(I) = 255 THEN IN =(S%(I+1) AND 3)*64:I=I+2:GOTO1020
1030 PH = S%(I) AND 63
1040 GOSUB 600:REM WRITE PHONEME
1060 NEXT I
1070 GOSUB 800:REM SEND STOP TO 4010
1080 RETURN
1995 REM
1996 REM SAY ALL ROUTINE
1997 REM
2000 FOR K = 0 TO A%(0)
2010 S%(K) = A%(K)
2020 NEXT K
2030 GOSUB 1000
2040 RETURN
2095 REM
2096 REM TRANSLATION ROUTINE
2097 REM
2100 LE = LEN(SP$):IF LE < 2 THEN IN$="-":GOSUB 2190:GOTO 2130
2105 PH = ASC(MID$(SP$,1,1))
2110 IF PH = 255 THEN GOSUB 2140:GOTO 2123
2120 GOSUB 2200
2123 S%(0) = K - 1
2125 GOSUB 1000:REM OUTPUT PHOMENE STRING
2130 RETURN
2140 FOR I = 1 TO LE
2150 PH = ASC(MID$(SP$,I,1))
2155 S%(I)=PH AND 63
2160 IF PH = 255THEN S%(I)=PH:I=I+1:IN$=MID$(SP$,I,1):GOSUB 2190:S%(I)=ASC(IN$)
2170 NEXT I
2175 K = I
2180 RETURN
2190 IF IN$ >"3" OR IN$ <"0"THEN PRINT "INFLECTION CONTROL <> 0-3":RETURN
2195 RETURN
2200 FL =-1:K=1
2210 FOR I = 0 TO LE-2 STEP 2
2220 IN$ = MID$(SP$,I+1,1)
2225 IN = ASC(IN$)
2230 IF IN <> FL THEN S%(K) =255: S%(K+1)=IN: FL =IN:K=K+2
2240 GOSUB 2190
2260 PH = ASC(MID$(SP$,I+2,1))
2270 S%(K) = PH:K=K+1
2300 NEXT I
2320 RETURN
3000 GOSUB 900:REM CLEAR SCREEN
3005 PRINT "      PROGRAM MAP":PRINT:
3010 PRINT "LINE #'S      FUNCTIONS
3015 PRINT:
3020 PRINT "10-180        PROGRAM DESCRIPTION
3030 PRINT "185-220       SET 4010 ADDRESSES"
3040 PRINT "294-350       MAIN ROUTINE"
3055 PRINT "396-470       ANNOTATION"
3057 PRINT "580-4000      SUBROUTINES"
```

```
3060 PRINT:
3070 PRINT "SUBROUTINE DESCRIPTIONS"
3080 PRINT:
3090 PRINT "ENTRY    LINE #'S  FUNCTIONS"
3110 PRINT "600      580-650   WRITE PHONEME"
3120 PRINT "700      695-730   START 4010"
3130 PRINT "800      794-810   STOP 4010"
3140 PRINT "900      895-910   CLEAR SCREEN"
3150 PRINT "1000     994-1080  OUTPUT STRING"
3160 PRINT "2000     1995-2040 SAY ALL"
3170 PRINT "2100     2096-2320 TRANSLATION"
3180 PRINT "3000     3000-4000 SUBROUTINE MAP"
4000 RETURN
READY.
```

The Voice Response Unit recognizes the keyboard characters (ASCII code) as phoneme commands in accordance with table 3-1. The phonemes may be entered from the Pet keyboard. An alphabetical listing is found in table 3-2. It is helpful to spend some time listening to each phoneme before trying to construct any words. Use the program to set up the conditions to listen to each phoneme and to phoneme combinations. Remember that each phoneme requires an inflection code from Ø to 3, with Ø being the lowest pitch and 3 being the highest pitch. Notice that some phonemes are duplicated with only a change in the number following the phoneme symbol, such as EH1, EH2, or EH3. These numbers refer to the duration of the vowel sound, with 1 being the longest duration and 3 being the shortest duration.

Table 3-1. Phoneme Coding

Phoneme Symbol	ASCII	Decimal	Phoneme Symbol	ASCII	Decimal
A1	@	ØØ	PA1**	Space	32
AH2	A	Ø1	12	!	33
B	B	Ø2	I	"	34
CH	C	Ø3	I3	#	35
D	D	Ø4	OO	$	36
E1	E	Ø5	OO1	%	37
F	F	Ø6	Y	&	38
G	G	Ø7	U	'	39
H	H	Ø8	IU	(	4Ø
I1	I	Ø9	A2	)	41
J	J	1Ø	AY	*	42
K	K	11	NG	+	43
L	L	12	AW	,‡	44
M	M	13	Ø DEC.	-	45
N	N	14	E	.	46
O1	O	15	ER	/	47
P	P	16	PAØ**	Ø	48
DT	Q	17	AW1	1	49
R	R	18	AW2	2	5Ø
S	S	19	EH1	3	51
T	T	2Ø	EH2	4	52
U1	U	21	EH3	5	53
V	V	22	UH1	6	54
W	W	23	UH2	7	55
ZH	X	24	UH3	8	56
Y1	Y	25	AE1	9	57
Z	Z	26	AE	:‡	58
O2	[	27	AH1	;	59
O	\	28	THV	<	6Ø
AH	]	29	TH	=	61
A	↑	3Ø	SH	>	62
Null	←	31			

‡ When using the INPUT statement, this character must be shifted.

AE, and is best programmed as AE1, I3. Another example of an allophone may be found in the numerous forms of K; the K in KEY, the K in LOOK, and the K sound in Q (which is programmed K, W as in QUIT). The proper allophone must be generated to produce intelligible synthetic speech.

Pure Vowels

Pure vowel sounds alone are not frequently found in all dialects of spoken English. Vowels are syllabic since whenever one is found in a word, it forms a syllable. Examples of the "short" vowels are as follows:

VOWEL	TYPICAL USAGE
AW	Awful
EH	Ten
ER	Her
UH	But
AE	Hat
Y	Mary
I	Kit
AH	Hot
OO	Book

These vowels can be heard to "glide" from beginning to end, but their glides are usually determined by the preceding and following phonemes. Such glides are generated automatically within the Voice Response Unit. However, you may find that the use of the coupling vowels I3, EH3, or UH3 in conjunction with a short vowel is an aid to natural sounding speech and intelligibility.

The numbered vowels such as UH1, UH2, and UH3 are of increasingly shorter duration. The higher the number, the shorter the duration. As a syllable is stressed less and less, a higher and higher number must be selected. The numbered vowels are also used in the "long" vowel phoneme pairs. For instance, A, AY is the vowel in MAIN; A1, AY or A2, AY would be the vowel in the same syllable in the word MAINTAIN. The numbered duration rule applies to all numbered vowels except Y1, which is Y used as a consonant such as in the word YES. It is also found at the beginning of a syllable such as the second syllable in the word UNUSUAL. Y1 is a different kind of sound than Y, as is evident when you sound these phonemes continuously. However, all other numbered vowels are exactly like their unnumbered, fully stressed counterparts if sounded continuously. As the number on a vowel increases, its time interval shortens, and its dynamic interaction between the preceding and following phonemes changes. Thus, two short duration phonemes will not have quite the same sound as one longer one of equal time duration. These differences are not evident if the phoneme is sounded continuously.

In addition to the syllabic stress factor affecting vowel length, the type of phoneme following the vowel is also a factor. If it is a sustained fricative such as S, the preceding vowel may be shortened. If it is a fricative stop such as T, the vowel may be shortened still further. The final determiner of vowel stress must be subjective judgement.

Diphthongs

A diphthong is the sound made when two different vowels are combined together in a single syllable. The use of glided vowels, diphthongs, is a common occurrence in English, particularly common with long vowels.

With diphthongs, a vowel ends as a different sound than it was when it started. The "long" vowels A, E, I, O, and U have glides which are sounded independently of preceding and following phonemes, even if these sounds are spoken alone. These vowels are programmed as follows on the Voice Response Unit:

VOWEL	TYPICAL USAGE	VOICE RESPONSE CODING
A	Name	A, AY
E	Tree	E or I3, E1
I	High	AH, E1
O	Note	UH1, O1
U	Two	IU, U

There are several classes of diphthongs, and examples are as follows:

DIPHTHONG	TYPICAL USAGE	VOICE RESPONSE CODING
I	High	AH, E1
I	Height	AH2, E1
OW, OU	Cow	AH1, O1*
		AH1, U1
OI, OY	Noise	O1, EH3, E1*
		O1, I3, E1
		O, E1

*Preferred

Consonants

CONSONANT	TYPICAL USAGE	VOICE RESPONSE CODING	NOTES
TH	Three	TH	
THV	Then	THV	the voiced TH
W	Won	W	
R	Area	R	
T	Tea	T	
P	Pot	P	
Y1	Yes	Y1	
S	See	S	
D	Day	D	
F	Fire	F	
G	Get	G	not the G in George
H	Hay, Ahead	H	
J	Jet, George	J	J is D,J or DT, J
K	Key, Sick, Car	K	
	Quick	KW	Q is KW

CONSONANT	TYPICAL USAGE	VOICE RESPONSE CODING	NOTES
L	Lie, Well	L	
NG	Bring	NG	
Z	Zero	Z	
SH	Shy	SH	
CH	Match, Chair	CH	CH is T, CH or DT, CH
V	Seven	V	
B	Bob	B	
N	Nine	N	
M	My	M	
ZH	Azure	ZH	the Z
	Measure	ZH	the S
DT	Butter	DT	DT is merely a tongue flap in this word

Affricates

There are two affricates in English. An affricate is a two-consonant combination with a fricative stop. Examples are found in the words JUDGE and LATCH. The voiced affricate J is programmed D, J or DT, J. The unvoiced affricate CH is programmed T, CH or DT, CH.

Liquids

The liquids are a particular class of phonemes (R, L, W, and Y1), which largely depend on the transitions into and out of these sounds for their recognition. These transitional phonemes are extremely important for maximum naturalness and intelligibility. Unfortunately, they depend a great deal on dialect and you must choose them carefully to meet your preference for the sound. Transitions around W and Y1 are often sufficiently dependent on surrounding phonemes that the Voice Response Unit will adequately generate them automatically.

The pre-vocalic R (R at the beginning of an utterance) normally does not require a transitional phoneme after it. However, the post-vocalic R (R at the end of an utterance) may require it, depending on the preceding vowel. An example of the post-vocalic R is found in the word AIR, which is programmed A, I3, R. Note the similarity of the phonetic designations to spelling. (EH3 in place of I3 is also acceptable for this word.)

The pre-vocalic L is enhanced by following it with UH3, EH3, or I3, depending on the following vowel. For instance, the word LAY is programmed L, EH3, A1, AY. The post-vocalic L is likewise enhanced by preceding it with UH3, EH3, or I3, such as in the word AIL. This is programmed as A, I3, L. Again, note the similarity to spelling. Again, EH3 may be used in place of I3.

Techniques

The following techniques may be used to enhance synthetic speech:

1. Phonemes may be doubled or tripled as required to improve intelligibility by slowing the word (or increasing its duration) or changing the syllabic emphasis. Initial and terminal consonants are often doubled to make them more clearly discernable. Final nasal and fricative consonants are frequently doubled to sustain them.

2. Use the neutral vowel "schwa" (UH1, UH2, UH3) in polysllabic words whenever it might better be substituted for the vowel found in the written word.

3. Use the short pause (PAØ) to assist in the separation of consonants.

4. Try various substitutions in programming similar sounds, such as UH2R or UH3R in place of ER.

5. Use H or PAØ as aspirates with initial consonants requiring aspiration.

INFLECTION CONTROL

Inflection is extremely important for synthesized speech to avoid a machine-like quality. Although ideal inflection is a subjective matter, a few simple rules will make this job easy. First determine the relative stress on various syllables in a word and on various words in a statement. Stronger stresses get longer phonemes and higher inflection pitches. The nominal pitch is half-way between inflection levels 1 and 2. The nominal pitch has a frequency of 125 to 130 Hertz, which is equivalent to the average pitch of an adult Caucasian male.

Thus, the Voice Response Unit is designed for most frequent use of inflections 1 and 2. You may choose to depart from this rule, however, unnatural pitch contours may be produced. Higher inflections and longer vowels should be used on stressed syllables and words; lower inflections and shorter vowels on unstressed syllables.

The pitch from any inflection command appears in the Voice Response Unit output separated in time from ½ a phoneme to a full phoneme later. Thus, if it is desired to stress a given phoneme, that phoneme should be a long one (if a vowel) and the highest inflection should probably be put on the preceding phoneme. This smoothing effect of inflection commands helps to make the speech flow more smoothly from phoneme-to-phoneme.

You may assemble a sentence out of a pre-stored vocabulary of words and have these words inflected according to sentence grammar. This is a complex technique, and it is often sufficient to store a vocabulary including nominal inflection commands for these words. (See Phonetic Dictionary in the Appendix.) When these words are assembled into sentences, the resulting speech may not be inflected perfectly, but, more importantly, it will be intelligible, and the pitch will vary smoothly from word to word. Thus, with the Voice Response Unit, there will be no pitch discontinuities at word boundaries, an inevitable shortcoming of systems utilizing pre-stored words of human speech.

Whether sentence programming is determined by software or manually by a programmer, the inflection level during any pause commands, as well as the binary zero position, should be inflection 1. Use of successive pause commands to produce long pauses may result in a slight background noise during the protracted pause interval—this is normal.

The Voice Response Unit is designed to generate continuous speech, such that the words in a sentence have little or no gap between them. This is consistent with conversational English habits. In conversation, it is usual for words within a phrase or clause to be strung together, while phrases and clauses are separated by a gap. There is no doubt that intelligibility in either human or synthesized speech is enhanced by short gaps between words. This is accomplished merely by placing a PAØ after each word. The resulting speech is somewhat choppy, but it is acceptable and highly intelligible. Use of such gaps will slow the output rate of the Voice Response Unit accordingly.

To produce prepausal lengthening of the past phoneme in an utterance (lengthening of the time duration of the last phoneme), the PA1 should be placed at the end of the utterance. The PAØ, or short pause, may be used instead, but the last phoneme in the utterance will be a little shorter. The PAØ is normally used between words in a sentence where very short pauses are desired. The PA1 is normally used at the end of an entire utterance, even if there is only a single word in the utterance. A word must not be followed by a binary zero (Null) command. If nulls are part of a phonetic data stream driving the synthesizer, a PAØ or PA1 must precede a null to prevent chopping off part of the last phoneme before the null.

In continuous speech, the synthesizer's built-in speech rules correspond to those in human speech. For instance, if two stop phonemes are adjacent, only the second phoneme is sounded. In the word FACT the K sound of the letter C and T are both fricative stops and only the second one in the pair is sounded. In this case, the only acoustic output attributable solely to these phonemes is the voiceless release of the T. The same applies if two adjacent stop phonemes are each in a different word. Examples of this are TACK-BOARD and CREDIT-BALANCE. If a pause command is programmed in between the two words in each pair, then both stop phonemes are sounded—the K and B in the first example, and the T and B in the second set. Note that, in these examples, the first phoneme of the pair in question is voiceless, while the second phoneme is voiced. It is optional whether or not to sound both stop phonemes. It is certainly natural in human speech not to sound the first stop phoneme, but it is less intelligible regardless of whether the speech is human or synthetic. This example is a classic case of naturalness as opposed to intelligibility. Thus, you control the option.

The choices of programming at word boundaries are as follows:

1. PA1 for separation of phrases and clauses and sentences.
2. PAØ for optional separation of words.
3. PAØ for enhancement of pronunciation of closure phoneme pairs.
4. PAØ or PA1 followed by a null as a word boundary indicator.

Appendix A

PHONETIC PROGRAMMING COMPUTER VOCABULARY

Zero	2/PA1 2/PA1	2/Z	3/A2	2/I2	2/I3	1/R	1/IU	1/UH3	1/02
	1/02	2 space 2 space	2 Z	3)	2 !	2 #	1 R	1 (	1 8
	1 0	1 0							
One	2/PA1 2 space	1/W 1 W	1/UH2 1 7	2/UH3 2 8	2/UH3 2 8	1/N 1 N	2/N 2 N	2/PA1 2 space	
Two	2/PA1 2 space	2/T 2 T	3/IU 3 (	1/IU 1 (	1/U1 1 U	1/U1 1 U	2/PA1 2 space		
Three	2/PA1 2 space	2/TH 2 =	3/IU 3 (	2/R 2 R	1/E1 1 E	1/Y 1 &	2/PA1 2 space		
Four	2/PA1 2 space	2/F 2 F	1/01 1 0	2/01 2 0	2/R 2 R	2/PA1 2 space			
Five	2/PA1 2 space	3/F 3 F	2/AH2 2 A	1/AH2 1 A	1/EH3 1 5	1/I3 1 #	1/Y 1 &	2/V 2 V	2/PA1 2 space
Six	2/PA1 2 space	2/S 2 S	2/S 2 S	1/I3 1 #	3/I3 3 #	2/I2 2 !	2/K 2 K	2/S 2 S	2/PA1 2 space
Seven	2/PA1 2 space	2/S 2 S	2/S 2 S	2/EH3 2 5	1/EH2 1 3	1/V 1 V	1/EH2 1 3	2/N 2 N	2/PA1 2 space
Eight	2/PA1 2 space	1/A2 1)	2/A2 2)	1/AY 1 *	2/Y 2 &	2/T 2 T	2/PA1 2 space		

Nine	2/PA1 2 space	2/N 2 N	1/AH1 1 ;	2/EH3 2 5	2/I3 2 #	1/Y 1 &	2/N 2 N	2/PA1 2 space	
Ten	2/PA1 2 space	3/T 3 T	3/EH3 3 5	1/EH2 1 4	1/EH2 1 4	1/N 1 N	1/N 1 N	2/PA1 2 space	
Eleven	2/PA1 2 space	1/E1 1 E	2/L 2 L	2/EH2 2 4	1/EH2 1 4	1/V 1 V	1/EH2 1 4	2/N 2 N	2/PA1 2 space
Twelve	2/PA1 2 space	3/T 3 T	2/W 2 W	2/EH2 2 4	1/EH2 1 4	1/UH2 1 8	1/L 1 L	1/V 1 V	2/PA1 2 space
Thirteen	2/PA1 2 space	2/TH 2 =	1/R 1 R	1/R 1 R	2/T 2 T	1/T 1 T	1/E1 1 E	2/Y 2 &	2/N 2 N
	2/PA1 2 space								
Fourteen	2/PA1 2 space	2/F 2 F	2/01 2 0	1/R 1 R	2/T 2 T	1/T 1 T	1/E1 1 E	2/Y 2 &	2/N 2 N
	2/PA1 2 space								
Fifteen	2/PA1 2 space	2/F 2 F	2/I3 2 #	2/I3 2 #	2/F 2 F	2/T 2 T	1/T 1 T	1/E1 1 E	2/Y 2 &
	2/N 2 N	2/PA1 2 space							
Sixteen	2/PA1 1/Y	2/S 2/N	2/S 2/PA1	3/I3	2/I3	2/K	2/S	1/T	1/T
	1/E1	2 space 1 &	2 S 2 N	2 S 2 space	3 #	2 #	2 K	2 S	1 T
	1 T	1 E							
Seventeen	2/PA1 2/N	2/S 2/PA1	2/EH3	1/EH3	2/V	2/I3	2/N	1/T	1/E1
	1/Y	2 space 2 N	2 S 2 space	2 5	1 5	2 V	2 #	2 N	1 T
	1 E	1 &							
Eighteen	2/PA1 2 space	2/A2 2)	1/AY 1 *	1/Y1 1 Y	1/T 1 T	2/T 2 T	2/E1 2 E	2/Y 2 &	2/N 2 N
	1/PA1 1 space								

Nineteen	2/PA1 2 space	1/N 1 N	2/AH1 2 ;	2/Y 2 &	1/N 1 N	1/T 1 T	1/E1 1 E	2/Y 2 &	2/N 2 N
	1/PA1 1 space								
Twenty	2/PA1 2 space	2/T 2 T	3/W 3 W	2/EH2 2 4	1/EH2 1 4	1/N 1 N	1/T 1 T	1/Y 1 &	2/PA1 2 space
Thirty	2/PA1 2 space	2/TH 2 =	1/IU 1 (	1/ER 1 /	2/T 2 T	1/AY 1 *	1/Y 1 &	2/PA1 2 space	
Forty	2/PA1 2 space	2/F 2 F	1/02 1 [	2/02 2 [	2/R 2 R	2/T 2 T	2/AY 2 *	2/PA1 2 space	
Fifty	2/PA1 2 space	2/F 2 F	3/I3 3 #	2/I3 2 #	1/F 1 F	1/T 1 T	1/AY 1 *	1/Y 1 &	2/PA1 2 space
Sixty	2/PA1 2 space	2/S 2 S	3/I3 3 #	2/I3 2 #	2/K 2 K	1/S 1 S	1/T 1 T	1/AY 1 *	1/Y 1 &
	2/PA1 2 space								
Seventy	2/PA1 2 space	2/S 2 S	3/EH3 3 5	2/EH3 2 5	2/V 2 V	2/EH3 2 5	1/N 1 N	1/T 1 T	1/AY 1 *
	2/Y 2 &	2/PA1 2 space							
Eighty	2/PA1 2 space	2/A2 2)	2/AY 2 *	1/Y1 1 Y	1/T 1 T	1/AY 1 *	2/Y 2 &	2/PA1 2 space	
Ninety	2/PA1 2 space	1/N 1 N	2/AH1 2 ;	1/Y 1 &	1/N 1 N	1/T 1 T	1/AY 1 *	2/Y 2 &	2/PA1 2 space
Twenty-One	2/PA1 2 space	2/T 2 T	1/W 1 W	1/EH2 1 4	1/N 1 N	2/T 2 T	1/Y 1 &	2/W 2 W	1/UH3 1 8
	1/UH2 1 7	1/N 1 N	2/N 2 N	2/PA1 2 space					
Thirty-Two	2/PA1 2 space	2/TH 2 =	2/IU 2 (	1/ER 1 /	2/T 2 T	1/Y 1 &	2/T 2 T	1/IU 1 (	1/IU 1 (
	1/U1 1 U	2/U1 2 U	2/PA1 2 space						
Forty-Three	2/PA1 2 space	1/F 1 F	1/01 1 0	1/R 1 R	1/T 1 T	2/Y 2 &	1/TH 1 =	1/IU 1 (	1/R 1 R
	1/E1 1 E	2/Y 2 &	2/PA1 2 space						

Fifty-Four	2/PA1 2 space	2/F 2 F	2/I2 2 !	2/F 2 F	2/T 2 T	2/Y 2 &	1/F 1 F	1/02 1 [	2/02 2 [
	2/R 2 R	2/PA1 2 space							
Sixty-Five	2/PA1 2 space	2/S 2 S	2/I2 2 !	3/K 3 K	2/S 2 S	3/T 3 T	1/Y 1 &	1/F 1 F	1/AH1 1 ;
	1/EH3 1 5	1/Y 1 &	2/V 2 V	2/PA1 2 space					
Seventy-Six	2/PA1 2/S	2/S 2/PA1	1/EH1	2/V	1/EH3	2/N	1/T	2/Y	1/S
	1/I3	1/I3	2/K	2 space 2 S	2 S 2 space	1 3	2 V	1 5	2 N
	1 T	2 &	1 S	1 #	1 #	2 K			
Eighty-Seven	2/PA1 2 space	1/A1 1 @	1/Y1 1 Y	1/T 1 T	1/Y 1 &	2/S 2 S	1/EH1 1 3	1/V 1 V	1/EH3 1 5
	1/N 1 N	2PA1 2 space							
Ninety-Eight	2/PA1 2 space	1/N 1 N	1/AH1 1 ;	1/AY 1 *	1/N 1 N	1/T 1 T	1/Y 1 &	2/A2 2)	2/Y1 2 Y
	2/T 2 T	2/PA1 2 space							
Forty-Nine	2/PA1 2 space	1/F 1 F	1)01 1 0	2/R 2 R	1/T 1 T	1/Y 1 &	1/N 1 N	1/AH2 1 A	2/AH2 2 A
	2/Y 2 &	2/N 2 N	2/PA1 2 space						
100	2/PA1 2/I3	1/W 2/D	1/UH3 2/PA1	1/UH3	2/N	2/H	1/UH3	1/UH3	1/N
	2/D	1/R	2 space 2 #	1 W 2 D	1 8 2 space	1 8	2 N	2 H	1 8
	1 8	1 N	2 D	1 R					
1,000	2/PA1 2/D	1/W 2/PA1	1/UH3	1/UH3	2/N	2/TH	1/AH1	1/U1	1/Z
	2/I3	2/N	2 space 2 D	1 W 2 space	1 8	1 8	2 N	2 =	1 ;
	1 U	1 Z	2 #	2 N					

1 Million	2/PA1 2/N	1/W 2/PA1	1/UH3	1/UH3	2/N	1/M	1/I3	1/I3	1/L
	1/Y1	1/EH3	2 space 2 N	1 W 2 space	1 8	1 8	2 N	1 M	1 #
	1 #	1 L	1 Y	1 5					
Point	2/PA1 2 space	2/P 2 P	1/02 1 [	1/02 1 [	2/I3 2 #	2/AY 2 *	1/N 1 N	1/T 1 T	2/PA1 2 space
Negative	2/PA1 2 space	2/N 2 N	1/EH3 1 5	2/EH3 2 5	1/G 1 G	2/EH2 2 4	1/T 1 T	1/I2 1 !	2/V 2 V
	2/PA1 2 space								
Positive	2/PA1 2/V	2/P 2/PA1	3/AH2	1/AH2	1/UH3	2/Z	1/EH2	1/T	2/I2
	2 space 2 V	2 P 2 space	3 A	1 A	1 8	2 Z	1 4	1 T	2 !
Equals	2/PA1 2 space	2/AY 2 *	2/E1 2 E	1/K 1 K	1/W 1 W	2/001 2 %	2/L 2 L	1/Z 1 Z	2/PA1 2 space
Minus	2/PA1 2 space	1/M 1 M	2/AH1 2 ;	1/AY 1 *	1/N 1 N	2/UH3 2 8	1/S 1 S	2/PA1 2 space	
Plus	2/PA1 2 space	2/P 2 P	1/L 1 L	2/UH2 2 7	1/UH2 1 7	2/S 2 S	2/PA1 2 space		
Times	2/PA1 2 space	2/T 2 T	1/AH1 1 ;	2/Y 2 Y	1/M 1 M	2/Z 2 Z	2/PA1 2 space		
Divided-By	2/PA1 1/PAØ	1/D 1/B	1/I3 1/AH2	1/I3 2/AH2	1/V 3/Y	2/AH2 2/PA1	1/AH2	2/AY	1/D
	1/I3	2/D*	2 space 1 Ø	1 D 1 B	1 # 1 A	1 # 2 A	1 V 3 Y	2 A 2 space	1 A
	2 *	1 D	1 #	2 D					
Delete	2/PA1 2 space	2/D 2 D	1/Y 1 &	1/L 1 L	2/E1 2 E	2/Y 2 &	2/T 2 T	2/PA1 2 space	
Erase	2/PA1 2 space	1/AY 1 *	2/IU 2 (	1/ER 1 /	1/A2 1 (	2/AY 2 *	2/Y 2 &	2/S 2 S	2/PA1 2 space
Enter	2/PA1 2 space	2/EH3 2 5	1/EH2 1 4	2/N 2 N	1/T 1 T	1/ER 1 /	2/PA1 2 space		

Clear	2/PA1 2 space	3/K 3 K	1/L 1 L	2/AY 2 *	1/I3 1 #	1/R 1 R	2/PA1 2 space		
Change	2/PA1 2 space	2/T 2 T	1/CH 1 C	2/A2 2)	1/A2 1)	2/Y 2 &	2/N 2 N	2/D 2 D	2/J 2 J
	2/PA1 2 space								
Sign (also Sine)	2/PA1 2 space	2/S 2 S	2/AH1 2 ;	1/EH3 1 5	1/Y 1 &	1/N 1 N	2/PA1 2 space		
Squared	2/PA1 2 space	2/S 2 S	1/K 1 K	2/W 2 W	3/EH2 3 4	1/EH2 1 4	1/R 1 R	1/D 1 D	2/PA1 2 space
Root	2/PA1 2 space	2/ER 2 /	1/U1 1 U	1/U1 1 U	1/T 1 T	2/PA1 2 space			
Invert	2/PA1 2 space	1/I3 1 #	1/I3 1 #	1/N 1 N	2/V 2 V	2/ER 2 /	1/R 1 R	1/T 1 T	2/PA1 2 space
Percent	2/PA1 2 space	2/P 2 P	1/ER 1 /	3/S 3 S	1/EH2 1 4	1/EH2 1 4	1/N 1 N	1/T 1 T	2/PA1 2 space
Integer	2/PA1 2 space	2/I3 2 #	1/I3 1 #	2/N 2 N	2/T 2 T	1/I2 1 !	1/D 1 D	1/J 1 J	1/ER 1 /
	2/PA1 2 space								
Log	2/PA1 2 space	1/L 1 L	2/AW2 2 2	1/AW2 1 2	1/AW2 1 2	1/G 1 G	2/PA1 2 space		
In	2/PA1 2 space	1/I 1 I	1/N 1 N						
Natural Log	2/PA1 1/L	1/N 1/AW2	2/AE1 1/AW2	1/EH3 1/AW2	2/T 1/G	2/CH 2/PA1	1/IU	1/R	2/UH3
	1/L	2/PAØ	2 space 1 L	1 N 1 2	2 9 1 2	1 5 1 2	2 T 1 G	2 C 2 space	1 (
	1 R	2 8	1 L	2 Ø					
Cosine (COS)	2/PA1 2 space	2/K 2 K	2/01 1 0	2/02 2 [	1/S 1 S	1/AH1 1 ;	1/EH3 1 5	1/Y 1 &	2/N 2 N
	2/PA1 2 space								
Tangent (TAN)	2/PA1 2 space	2/T 2 T	2/AE1 2 9	2/AE1 2 9	1/N 1 N	2/D 2 D	1/J 1 J	1/I3 1 #	2/N 2 N

	2/T 2 T	2/PA1 2 space							
Absolute (ABS)	2/PA1 2 space	1/AE1 1 9	2/EH3 2 5	1/B 1 B	2/S 2 S	2/UH2 2 7	3/L 3 L	1/IU 1 (	1/U1 1 U
	1/T 1 T	2/PA1 2 space							
π (PI)	2/PA1 2 space	2/P 2 P	2/AH2 2 A	1/AH2 1 A	1/EH? 1 5	1/I3 1 #	2/AY 2 *	2/PA1 2 space	
Store	2/PA1 2 space	2/S 2 S	2/T 2 T	2/01 2 0	1/01 2 0	1/R 1 R	2/PA1 2 space		
Recall	2/PA1 2 space	1/R 1 R	2/Y 2 &	1/K 1 K	1/AW1 1 1	1/AW2 1 2	2/L 2 L	2/PA1 2 space	
To the . . .	2/PA1 2 space	2/T 2 T	1/IU 1 (	2/U1 2 U	1/THV 1 <	1/UH3 1 8	2/UH3 2 8	1/UH3 1 8	. . . . . .
. . power . .	. . . . . .	2/P 2 P	2/AH1 2 ;	1/UH3 1 8	1/W 1 W	2/ER 2 /	. . . . . .		
. . of	. . . . . .	1/UH3 1 8	1/UH3 1 8	2/UH2 2 7	2/V 2 V	2/PA1 2 space			
Register	2/PA1 2 space	2/R 2 R	1/EH2 1 4	2/EH3 2 5	1/D 1 D	1/J 1 J	1/I2 1 !	1/S 1 S	1/T 1 T
	1/ER 1 /	2/PA1 2 space							
Switch	2/PA1 2 space	2/S 2 S	2/W 2 W	2/I3 2 #	1/I2 1 !	2/T 2 T	1/Ch 1 C	2/PA1 2 space	
Define	2/PA1 2 space	2/D 2 D	1/E1 1 E	2/F 2 F	1/AH2 1 A	2/AH2 2 A	2/Y 2 &	2/N 2 N	2/PA1 2 space
Function	2/PA1 2 space	1/F 1 F	2/UH3 2 8	1/UH3 1 8	1/N 1 N	2/K 2 K	1/SH 1 >	1/UH3 1 8	2/N 2 N
	2/PA1 2 space								
Dimension	2/PA1 2 space	2/D 2 D	1/I2 1 !	2/M 2 M	3/EH3 3 8	2/EH2 2 7	1/N 1 N	2/SH 2 >	1/UH3 1 8
	2/N 2 N	2/PA1 2 space							
End	2/PA1 2 space	3/EH3 3 8	1/EH3 1 8	1/EH2 1 7	1/N 1 N	1/N 1 N	1/D 1 D	2/PA1 2 space	

For	2/PA1	2/F	1/02	2/01	1/r	2/PA1			
	2 space	2 F	1 [	2 0	1 R	2 space			
Step	2/PA1	2/S	1/T	3/EH3	1/EH2	1/P	2/PA1		
	2 space	2 S	1 T	3 5	1 4	1 P	2 space		
Next	2/PA1	2/N	2/EH3	1/EH2	1/K	2/S	2/T	2/PA1	
	2 space	2 N	2 5	1 4	1 K	2 S	2 T	2 space	
Get	2/PA1	2/G	1/EH2	2/EH3	1/T	2/PA1			
	2 space	2 G	1 4	2 5	1 T	2 space			
Gosub	2/PA1	1/G	1/02	1/01	2/S	1/UH2	2/UH2	1/B	2/PA1
	2 space	1 G	1 [	1 0	2 S	1 7	2 7	1 B	2 space
Return	2/PA1	1/R	1/Y	3/T	2/R	1/ER	1/N	2/PA1	
	2 space	1 R	1 &	3 T	2 R	1 /	1 N	2 space	
Goto	2/PA1	1/G	1/02	1/01	2/T	1/IU	1/U1	2/U1	2/PA1
	2 space	1 G	1 [	1 0	2 T	1 (	1 U	2 U	2 space
If	2/PA1	1/I2	2/I3	1/I3	1/F	2/PA1			
	2 space	1 !	3 #	1 #	1 F	2 space			
Then	2/PA1	2/THV	1/EH2	1/EH2	2/EH3	2/N	2/PA1		
	2 space	2 <	1 4	1 4	2 5	2 N	2 space		
Input	2/PA1	2/I1	1/N	2/P	2/00	1/T	2/PA1		
	2 space	1 I	1 N	2 P	2 $	1 T	2 space		
Let	2/PA1	1/L	1/EH2	1/EH3	2/EH3	2/T	2/PA1		
	2 space	1 L	1 4	1 5	2 5	2 T	2 space		
On	2/PA1	1/UH3	1/AH2	1/AH2	2/UH3	2/N	2/PA1		
	2 space	1 8	1 A	1 A	2 8	2 N	2 space		
Poke	2/PA1	2/P	1/01	2/01	1/K	2/PA1			
	2 space	2 P	1 0	2 0	1 K	2 space			
Peek	2/PA1	2/P	1/E1	2/Y	1/K	2/PA1			
	2 space	2 P	1 E	2 &	1 K	2 space			
Print	2/PA1	2/P	1/R	1/I2	2/I2	2/N	2/T	2/PA1	
	2 space	2 P	1 R	1 !	2 !	2 N	2 T	2 space	
Read	2/PA1	1/R	2/AY	1/E1	1/Y	2/D	2/PA1		
	2 space	1 R	2 *	1 E	1 &	2 D	2 space		
Data	2/PA1	2/D	1/A2	1/A2	2/AY	1/T	1/UH3	2/UH3	2/PA1
	2 space	2 D	1)	1)	2 *	1 T	1 8	2 8	2 space
(Re)store	2/PA1	2/S	1/T	2/01	1/01	2/R	2/PA1		
	2 space	2 S	1 T	2 0	1 0	2 R	2 space		

REM	2/PA1 2 space	1/R 1 R	2/EH2 2 4	1/EH3 1 5	1/UH3 1 8	2/PA1 2 space			
REMark	2/PA1 2 space	1/R 1 R	1/Y 1 &	2/M 2 M	2/AH2 2 A	1/AH2 1 A	1/UH3 1 8	2/R 2 R	1/K 1 K
	2/PA1 2 space								
Stop	2/PA1 2 space	2/S 2 S	3/T 3 T	2/AH2 2 A	1/AH2 1 A	1/UH3 1 8	1/P 1 P	2/PA1 2 space	
Continue	2/PA1 2 space	2/K 2 K	1/UH2 1 7	1/N 1 N	3/T 3 T	2/I2 2 !	1/I3 1 #	2/N 2 N	1/Y1 1 Y
	1/IU 1 (	2/U1 2 U	2/PA1 2 space						
Wait	2/PA1 2 space	1/W 2 W	1/A2 1)	2/A2 2)	1/AY 1 *	2/T 2 T	2/PA1 2 space		
List	2/PA1 2 space	1/L 1 L	2/I2 2 !	1/I2 1 !	2/I2 2 !	2/S 2 S	2/T 2 T	2/PA1 2 space	
Load	2/PA1 2 space	1/L 1 L	1/001 1 %	1/02 1 [	2/01 2 0	2/D 2 D	2/PA1 2 space		
New	2/PA1 2 space	2/N 2 N	1/IU 1 (	1/U1 1 U	2/U1 2 U	2/PA1 2 space			
Run	2/PA1 2 space	2/R 2 R	2/UH3 2 8	1/UH3 1 8	1/UH2 1 7	1/N 1 N	1/N 1 N	2/PA1 2 space	
Save	2/PA1 2 space	2/S 2 S	1/A2 1)	2/A2 2)	1/AY 1 *	1/Y 1 &	2/V 2 V	2/PA1 2 space	
Verify	2/PA1 2 space	1/V 1 V	2/EH3 2 5	2/EH2 2 4	1/R 1 R	2/EH2 2 4	1/F 1 F	1/AH2 1 A	1/AH2 1 A
	2/Y 2 &	2/PA1 2 space							
ASCII	2/PA1 2 space	1/AE1 1 9	2/AE1 2 9	1/S 1 S	1/K 1 K	2/AY 2 *	1/Y 1 &	2/PA1 2 space	
CHAR $	2/PA1 2/ER	2/K 2/PA1	2/EH3	1/EH2	1/ER	2/PAØ	1/D	1/AH1	1/UH3
	1/L	2 space 2 /	2 K 2 space	2 5	1 4	1 /	2 Ø	1 D	1 ;
	1 8	1 L							

Len	2/PA1 2 space	1/L 1 L	1/EH2 1 4	2/EH2 2 4	2/EH3 2 5	2/N 2 N	2/PA1 2 space		
Left $	2/PA1 1/L	2/L 2/ER	2/EH3 2/PA1	1/EH2	2/F	1/T	1/PA0	1/D	1/AH1
	1/UH3	2 space 1 L	2 L 2 /	2 5 2 space	1 4	2 F	1 T	1 0	1 D
	1 ;	1 8							
Length	2/PA1 2 space	1/L 1 L	1/EH3 1 5	2/EH3 2 5	2/I3 2 #	2/N 2 N	2/DT 2 Q	2/TH 2 =	2/TH 2 =
	2/PA1 2 space								
MID $	2/PA1 2 space	2/M 2 M	2/I3 2 #	1/I2 1 !	2/D 2 D	1/PA0 1 0	1/D 1 D	1/AH1 1 ;	1/UH3 1 8
	1/L 1L	2/ER 2 /	2/PA1 2 space						
Right $	2/PA1 2/ER	1/R 2/PA1	2/UH3	2/AH2	2/Y	1/T	1/PA0	1/D	1/AH1
	1/UH3	1/L	2 space 2 /	1 R 2 space	2 8	2 A	2 Y	1 T	1 0
	1 D	1 ;	1 8	1 L					
String $	2/PA1 1/L	3/S 2/ER	2/T 2/PA1	2/R	2/I2	1/I3	1/NG	1/PA0	1/D
	1/AH1	1/UH3	2 space 1 L	3 S 2 /	2 T 2 space	2 R	2 !	1 #	1 +
	1 0	1 D	1 ;	1 8					
VAL	2/PA1 2 space	1/V 1 V	1/AE1 1 9	2/AE1 2 9	2/UH3 2 8	2/L 2 L	2/PA1 2 space		
VALue	2/PA1 2 space	2/V 2 V	2/AE1 2 9	1/AW2 1 2	1/L 1 L	1/Y1 1 Y	1/IU 1 (	1/U1 1 U	2/U1 2 U
	2/PA1 2 space								
ArcTANgent	2/PA1 2/J	2/AH1 1/I3	2/UH3 2/N	1/R 2/T	1/K 2/PA1	1/PA0	2/T	1/AE1	1/EH3

	1/N	2/D	2 space 2 J	1 ; 1 #	2 8 2 N	1 R 2 T	1 K 2 space	1 Ø	2 T
	1 9	1 5	1 N	2 D					
EXPonent	2/PA1 2/N	2/EH2 2/T	1/EH2 2/PA1	1/K	2/PAØ	2/S	2/P	1/01	1/02
	1/N	2/I2	2 space 2 N	2 4 2 T	1 4 2 space	1 K	2 Ø	2 S	2 P
	1 0	1 [	1 N	2 !					
RANDom	2/PA1 2 space	1/R 1 R	2/AE1 2 9	2/AE1 2 9	1/N 1 N	1/D 1 D	1/UH3 1 8	2/M 2 M	2/PA1 2 space
Arithmetic-sign	2/PA1 2/T	1/EH1 2/I2	2/R 3/K	1/I2 2/PAØ	2/I3 1/S	1/TH 1/AH2	1/TH 1/AH2	2/M 1/EH3	2/EH3 1/Y
	2/EH3 2/N	2/PA1	2 space 2 T	1 3 2 !	2 R 2 K	1 ! 2 Ø	2 # 1 S	1 = 1 A	1 = 1 A
	2 M 1 5	2 5 1 Y	2 = 2 N	2 space					
SQuare-Root	2/PA1 1/U1	2/S 1/T	1/K 2/PA1	2/W	3/EH2	1/EH2	2/R	1/PAØ	2/ER
	1/U1	2 space 1 U	2 S 1 T	1 K 2 space	2 W	3 4	1 4	2 R	1 Ø
	2 /	1 U							
Less Than	2/PA1 2 space	2/L 2 L	2/EH2 2 4	1/EH3 1 5	2/S 2 S	1/THV 2 <	1/AE1 1 9	1/AE1 1 9	2/EH3 2 5
	2/N 2 N	2/PA1 2 space							
Greater Than	2/PA1 2/EH3	2/G 1/N	2/R 2/PA1	3/A2	2/A2	2/Y	2/T	1/ER	1/THV
	1/AE1	1/EH3	2 space 2 5	2 G 1 N	2 R 2 space	3)	2)	2 &	2 T
	1 /	1 <	1 9	1 5					
Not Equal	2/PA1 1/L	1/N 2/PA1	2/AH1	3/UH3	2/T	2/PAØ	2/AY	2/Y	1/K

	1/W	1/001	2 space 1 L	1 N 2 space	2 ;	3 8	2 T	2 Ø	2 *
	2 &	1 K	1 W	1 %					
And	2/PA1 2 space	2/AE1 2 9	1/AE1 1 9	2/EH3 2 5	2/N 2 N	2/D 2 D	2/PA1 2 space		
Or	2/PA1 2 space	1/01 1 0	2/02 2 [	1/R 1 R	2/PA1 2 space				
Not	2/PA1 2 space	1/N 1 N	1/AH1 1 ;	2/UH3 2 8	2/T 2 T	2/PA1 2 space			
Quote	2/PA1 2 space	1/K 1 K	2/W 2 W	1/02 1 [	2/02 2 [	2/U1 2 U	2/T 2 T	2/PA1 2 space	
Paren	2/PA1 2 space	2/P 2 P	1/EH3 1 5	1/EH2 1 4	2/EH3 2 5	2/R 2 R	2/I2 2 !	2/N 2 N	2/PA1 2 space
Pound	2/PA1 2 space	2/P 2 P	2/AH1 2 ;	1/UH3 1 8	1/U1 1 U	1/N 1 N	2/D 2 D	2/PA1 2 space	
Comma	2/PA1 2 space	2/K 2 K	2/AH2 2 A	1/AH2 1 A	1/UH3 1 8	1/M 1 M	1/UH3 1 8	2/UH3 2 8	2/PA1 2 space
Open	2/PA1 2 space	2/01 2 0	1/02 1 [	1/P 1 P	1/I3 1 #	2/I3 2 #	2/N 2 N	2/PA1 2 space	
Close	2/PA1 2 space	2/K 2 K	1/L 1 L	2/UH3 2 8	2/02 2 [	2/02 2 [	1/U1 1 U	1/Z 1 Z	2/PA1 2 space
D Open	2/PA1 2 space	2/D 2 D	2/AY 2 *	2/Y 2 &	1/PAØ 1 Ø	1/01 1 0	1/02 1 [	1/P 1 P	2/I2 2 !
	2/N 2 N	2/PA1 2 space							
D Close	2/PA1 2 space	2/D 2 D	1/AY 1 *	2/Y 2 &	2/PAØ 2 Ø	2/K 2 K	1/L 1 L	1/01 1 0	2/02 2 [
	1/U1 1 U	2/Z 2 Z	2/PA1 2 space						
Record	2/PA1 2 space	2/R 2 R	3/EH3 3 5	2/EH3 2 5	1/K 1 K	1/ER 1 /	2/R 2 R	1/D 1 D	2/PA1 2 space
Size	2/PA1 2 space	3/S 3 S	2/AH2 2 A	1/AH2 1 A	1/EH3 1 5	1/I3 1 #	2/Y 2 &	2/Z 2 Z	2/PA1 2 space
Write	2/PA1 2 space	1/R 1 R	3/UH3 3 8	2/AH2 2 A	1/Y 1 &	1/T 1 T	2/PA1 2 space		

Drive	2/PA1 2 space	2/D 2 D	1/R 1 R	3/AH2 3 A	2/AH2 2 A	1/EH3 1 5	1/Y 1 &	1/V 1 V	2/PA1 2 space
Number	2/PA1 2 space	2/N 2 N	3/UH3 3 8	1/UH3 1 8	1/M 1 M	1/B 1 B	1/ER 1 /	2/PA1 2 space	
Scratch	2/PA1 2 space	3/S 3 S	1/K 1 K	2/R 2 R	2/AE1 2 9	1/AE1 1 9	1/T 1 T	2/CH 2 C	2/PA1 2 space
Rename	2/PA1 2 space	2/R 2 R	1/Y 1 Y	2/N 2 N	1/A2 1)	1/A2 1)	1/Y 1 &	3/M 3 M	2/PA1 2 space
Collect	2/PA1 2 space	2/K 2 K	1/UH3 1 8	2/UH3 2 8	2/L 2 L	2/EH3 2 5	1/EH2 1 4	1/K 1 K	1/T 1 T
	2/PA1 2 space								
Header	2/PA1 2 space	2/H 2 H	1/EH3 1 5	2/EH2 2 4	3/D 3 D	2/R 2 R	2/R 2 R	2/PA1 2 space	
Directory	2/PA1 2 space	1/D 1 D	1/ER 1 /	2/EH3 2 5	2/EH2 2 4	1/K 1 K	2/PA0 2 0	2/T 2 T	1/ER 1 /
	2/Y 2 &	2/PA1 2 space							
Back Up	2/PA1 2 space	2/B 2 B	2/AE1 2 9	2/AE1 2 9	1/K 1 K	1/UH3 1 8	1/UH2 1 7	2/P 2 P	2/PA1 2 space
SYS	2/PA1 2 space	2/S 2 S	2/S 2 S	3/I3 3 #	1/I3 1 #	2/I3 2 #	1/S 1 S	2/PA1 2 space	
TAB	2/PA1 2 space	3/T 3 T	2/AE1 2 9	1/AE1 1 9	1/EH3 1 5	1/B 1 B	2/PA1 2 space		
Space	2/PA1 2 space	3/S 3 S	1/P 1 P	2/A2 2)	1/A2 1)	1/AY 1 *	2/Y 2 &	2/S 2 S	2/PA1 2 space
CONCAT	2/PA1 2 space	1/K 1 K	2/AH1 2 ;	1/UH3 1 8	2/N 2 N	1/K 1 K	1/AE1 1 9	2/AE1 2 9	2/EH3 2 5
	2/T 2 T	2/PA1 2 space							
APPEND	2/PA1 2 space	1/UH1 1 6	3/P 2 P	2/EH3 2 5	1/EH3 1 5	1/EH2 1 4	1/N 1 N	2/D 2 D	2/PA1 2 space
Calculator . .	2/PA1 2 space	2/K 2 K	3/AE1 3 9	2/UH3 2 8	1/L 1 L	2/K 2 K	2/UH3 2 8	2/L 2 L	1/A2 1)
	2/AY 2 *	2/T 2 T	1/ER 1 /	. . . .					

. . words	1/W	1/ER	1/R	1/D	1/Z	2/PA1		
	1 W	1 /	1 R	1 D	1 Z	2 space		
Basic	2/PA1	1/B	2/A1	1/Y	1/S	2/I2	1/K	2/PA1
	2 space	1 B	2 @	1 &	1 S	2 !	1 K	2 space

Appendix B

VOICE RESPONSE UNIT PROGRAMMING DICTIONARY

Able	2/PA1,	2/A2,	1/A2,	1/Y,	1/B,	1/L			
	1 space	2)	1)	1 Y	1 B	1 L			
Account	1/PA1,	1/UH2,	2/K,	1/AH1,	1/U1,	1/N,	1/T		
	1 space	1 7	2 K	1 ;	1 U	1 N	1 T		
Active	2/PA1,	2/AE1,	2/EH3,	1/K,	1/PAØ,	1/T,	1/I2,	1/V	
	2 space	2 9	2 5	1 K	1 Ø	1 T	1 !	1 V	
Add	2/PA1,	1/AE,	1/EH3,	1/D					
	2 space	1 :‡	1 5	1 D					
Address	1/PA1,	1/UH2,	2/D,	2/R,	1/EH1,	1/S,	1/S		
	1 space	1 7	2 D	2 R	1 3	1 S	1 S		
Adjust	1/PA1,	1/UH2,	1/D,	2/J,	2/UH3,	1/UH1,	1/S,	1/T	
	1 space	1 7	1 D	2 J	2 8	1 6	1 S	1 T	
Advance	1/PA1,	1/EH2,	1/D,	2/V,	1/AH1,	1/EH3,	1/N,	1/S	
	1 space	1 4	1 D	2 V	1 9	1 5	1 N	1 S	
After	2/PA1,	1/AE,	1/F,	1/T,	1/ER				
	2 space	1 :‡	1 F	1 T	1 /				
Afternoon	1/PA1,	1/AE1,	1/F,	2/T,	1/R,	2/N,	1/IU,	1/U,	1/N
	1 space	1 9	1 F	2 T	1 R	2 N	1 (	1 ’	1 N
Again	1/PA1,	1/UH1,	2/G,	1/EH,	1/N				
	1 space	1 6	2 G	1 3	1 N				
Air	2/PA1,	1/A2,	1/EH2,	1/ER					
	2 space	1)	1 4	1 /					

‡ When using the INPUT statement, this character must be shifted.

All	2/PA1, 2 space	1/AW, 1 ,‡	1/UH3, 1 8	1/L 1 L				
Am	2/PA1, 2 space	1/AE1, 1 9	1/EH3, 1 5	1/UH3, 1 8	1/M 1 M			
A.M.	1/PA1, 1/EH1,	1/A2, 1/UH3,	2/AY2, 1/M	2/Y,	2/PAØ,	2/PAØ,	2/EH3,	1 space 1 3 1) 1 8
	2 * 1 M	2 Y	2 Ø	2 Ø	2 5			
America	1/PA1, 1/K	1/UH2, 1/UH1	3/M,	2/EH2,	1/EH2,	1/R,	1/EH3,	1 space 1 K 1 7 1 6
	3 M	2 4	1 4	1 R	1 5			
Amount	1/PA1, 1 space	1/UH2, 1 7	2/M, 2 M	2/UH3, 2 8	1/AH1, 1 ;	1/U1, 1 (	1/N, 1 N	1/T 1 T
An	2/PA1, 2 space	1/AE1, 1 9	1/EH3, 1 5	1/I3, 1 #	1/N 1 N			
And	2/PA1, 2 space	1/AE1, 1 9	1/EH3, 1 5	1/I3, 1 #	1/N, 1 N	1/D 1 D		
Answer	2/PA1, 2 space	2/AE1, 2 9	1/I3, 1 #	2/N, 2 N	1/S, 1 S	1/R, 1 R	1/R 1 R	
Application	1/PA1, 1/SH,	1/AE1, 1/UH3,	2/P, 1/N	1/L,	1/UH3,	1/A1,	1/Y1,	1 space 1 > 1 9 1 8
	2 P 1 N	1 L	1 8	1 @	1 Y			
Approve	1/PA1, 1 space	1/UH2, 1 7	3/P, 3 P	2/R, 2 R	1/U, 1 ’	1/V 1 V		
April	1/PA1, 1 space	1/A1, 1 @	2/AY, 2 *	1/P, 1 P	1/R, 1 R	1/UH3, 1 8	2/L 2 L	
Are	2/PA1, 2 space	1/AH1, 1 ;	1/UH3, 1 8	1/ER 1 /				
Assign	1/PA1, 1 space	1/UH2, 1 7	3/S, 3 S	1/AH1, 1 ;	1/E1, 1 .	1/N 1 N		
Assist	1/PA1, 1 space	1/UH2, 1 7	3/S, 3 S	1/I, 1 ”	1/S, 1 S	1/T 1 T		
At	2/PA1, 2 space	1/AE1, 1 9	1/EH3, 1 5	1/T 1 T				

‡ When using the INPUT statement, this character must be shifted.

Atlantic	1/PA1, 1 space	1/EH2, 1 4	1/T, 1 T	2/L, 2 L	1/AE1, 1 9	1/N, 1 N	1/T, 1 T	1/I3, 1 #	1/K 1 K
August	2/PA1, 2 space	1/AW, 1 ,‡	2/G, 2 G	1/EH2, 1 4	1/S, 1 S	1/T 1 T			
Available	2/PA1, 1/UH3,	1/UH2, 1/L	2/V,	2/A1,	2/AY,	1/L,	1/UH3,	1/B	2 space 1 8
	1 7 1 L	2 V	1 @	1 *	1 L	1 8	1 B		
Average	2/PA1, 2 space	1/AE1, 1 9	1/I3, 1 #	1/V, 1 V	1/R, 1 R	1/I2, 1 !	1/D, 1 D	1/J 1 J	
Away	1/PA1, 1 space	1/UH2, 1 7	2/W, 2 V	1/A1, 1 @	1/AY, 1 *	1/AY 1 *			
Back	1/PA1, 1 space	3/B, 3 B	2/AE1, 2 9	1/EH3, 1 5	1/K 1 K				
Be	1/PA1, 1 space	2/B, 2 B	1/E1, 1 E	1/E1 1 E					
Because	1/PA1, 1 space	1/B, 1 B	1/Y1, 1 Y	2/K, 2 K	1/UH1, 1 6	2/UH2, 2 7	1/Z 1 Z		
Been	1/PA1, 1 space	2/B, 2 B	1/EH3, 1 5	1/EH1, 1 3	1/N 1 N				
Before	1/PA1, 1 space	1/B, 1 B	1/E1, 1 E	3/F, 3 F	1/0, 1 \	1/R 1 R			
Begin	1/PA1, 1 space	1/B, 1 B	1/E1, 1 E	3/G, 3 G	1/I3, 1 #	1/I1, 1 I	1/N 1 N		
Benefit	1/PA1, 1 space	3/B, 3 B	1/EH1, 1 3	1/N, 1 N	1/EH3, 1 5	2/F, 2 F	1/I3, 1 #	1/T 1 T	
Between	1/PA1, 1 space	1/B, 1 B	1/I2, 1 !	3/T, 3 T	1/W, 1 W	1/E1, 1 E	1/E1, 1 E	1/N 1 N	
But	1/PA1, 1 space	1/B, 1 B	1/UH1, 1 6	2/UH3, 2 8	2/T 2 T				
By	1/PA1, 1 space	2/B, 2 B	1/AH1, 1 ;	1/E1 1 E					
Call	2/PA1, 2 space	2/K, 2 K	1/AW, 1 ;	1/L 1 L					

‡ When using the INPUT statement, this character must be shifted.

Can	2/PA1, 2 space	2/K, 2 K	1/AE, 1 :‡	1/EH3, 1 5	1/EH3, 1 5	1/N 1 N			
Car	2/PA1, 2 space	3/K, 3 K	1/AH, 1]	1/R 1 R					
Care	2/PA1, 2 space	2/K, 2 K	1/A2, 1)	1/EH2, 1 4	1/R 1 R				
Careful	2/PA1, 2 space	2/K, 2 K	1/A2, 1)	1/EH2, 1 4	1/R, 1 R	1/F, 1 F	1/UH3, 1 8	1/L 1 L	
Case	2/PA1, 2 space	2/K, 2 K	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/S 1 S			
Cash	2/PA1, 2 space	2/K, 2 K	1/AE, 1 :‡	1/EH3, 1 5	1/SH 1 >				
Caution	2/PA1, 2 space	2/K, 2 K	2/AW, 2 ,‡	1/SH, 1 >	1/UH3, 1 8	1/N 1 N			
Cents	2/PA1, 2 space	2/S, 2 S	2/EH3, 1 5	1/EH1, 1 3	1/N, 1 N	1/S 1 S			
Change	2/PA1, 2 space	2/T, 2 T	2/CH, 2 C	2/EH3, 2 5	1/A1, 1 @	1/Y, 1 &	1/N, 1 N	1/D, 1 D	1/J 1 J
Charge	2/PA1, 2 space	2/T, 2 T	2/CH, 2 C	1/AH, 1]	1/R, 1 R	1/D, 1 D	1/J 1 J		
Check	2/PA1, 2 space	2/T, 2 T	2/CH, 2 C	1/EH, 1 3	1/K 1 K				
City	2/PA1, 2 space	3/S, 3 S	1/I1, 1 I	1/DT, 1 Q	1/E1 1 E				
Class	2/PA1, 2 space	2/K, 2 K	1/L, 1 L	1/AE, 1 :‡	1/UH3, 1 8	1/S 1 S			
Classification	2/PA1, 2/K, 2 K 2 @	2/K, 2/A1, 1 L 1 Y	2/L, 1/Y1, 1 9 1 >	1/AE1, 1/SH, 2 S 1 8	2/S, 1/UH3, 1 ∝ 1 N	1/I3, 1/N 2 F	2/F, 1 #	1/I3,	2 space 2 K
Clear	2/PA1, 2 space	2/K, 2 K	2/L, 2 L	2/I3, 2 #	1/I1, 1 I	1/R 1 R			
Clearance	2/PA1, 2 space	2/K, 2 K	2/L, 2 L	2/I3, 2 #	1/I2, 1 !	1/R, 1 R	1/EH3, 1 5	1/N, 1 N	1/S 1 S
Clock	2/PA1, 2 space	2/K, 2 K	2/L, 2 L	1/AH1, 1 ;	1/UH3, 1 8	1/K 1 K			

‡ When using the INPUT statement, this character must be shifted.

Close *	2/PA1, 2 space	2/K, 2 K	2/L, 2 L	1/UH3, 1 8	1/01, 1 0	1/U1, 1 U	1/Z 1 Z		
Close *	2/PA1, 2 space	2/K, 2 K	2/L, 2 L	1/UH3, 1 8	1/01, 1 0	1/U1, 1 U	1/S 1 S		
Code	2/PA1, 2 space	2/K, 2 K	1/02, 1 [	1/01, 1 0	1/U1, 1 U	1/D 1 D			
Collect	1/PA1, 1/K,	2/K, 1/PAØ,	1/UH2, 1/T	3/L,	2/UH3,	1/EH2,	1/EH2,	1 space 1 K	2 K 1 space
	1 7 1 T	3 L	2 8	1 4	1 4				
Commit	1/PA1, 1 space	1/K, 1 K	1/UH2, 1 7	3/M, 3 M	1/I1, 1 I	1/T 1 T			
Complete	1/PA1, 1 space	1/K, 1 K	1/UH3, 1 8	1/M, 1 M	3/P, 3 P	1/L, 1 L	1/E, 1 .	1/T 1 T	
Condition	1/PA1, 1 space	1/K, 1 K	1/UH3, 1 8	1/N, 1 N	2/D, 2 D	1/I2, 1 !	1/SH, 1 >	1/UH3, 1 8	1/N 1 N
Confirm	1/PA1, 1 space	1/K, 1 K	1/UH3, 1 8	1/N, 1 N	3/F, 3 F	1/R, 1 R	1/R, 1 R	1/M 1 M	
Contact	2/PA1, 1/PAØ,	2/K, 1/T	1/AH1,	1/N,	1/T,	1/AE1,	1/EH3,	1/K,	2 space 1 Ø
	2 K 1 T	1 ;	1 N	1 T	1 9	1 3	1 K		
Correct	2/PA1, 2 space	1/K, 1 K	1/R, 1 R	2/R, 2 R	1/EH1, 1 3	1/K, 1 K	1/PAØ, 1 Ø	1/T 1 T	
Cost	2/PA1, 2 space	2/K, 2 K	1/AW, 1 ,‡	1/S, 1 S	1/T 1 T				
Customer	2/PA1, 2 space	2/K, 2 K	2/UH2, 2 7	1/S, 1 S	1/T, 1 T	1/UH3, 1 8	1/M, 1 M	1/R 1 R	
Daily	2/PA1, 2 space	2/D, 2 D	2/A1, 2 @	1/Y, 1 &	1/L, 1 L	1/Y 1 &			
Data	2/PA1, 2 space	3/D, 3 D	1/A1, 1 @	1/AY, 1 *	1/DT, 1 Q	1/UH2 1 7			
Date	2/PA1, 2 space	3/D, 2 D	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/T 1 T			
Day	2/PA1, 2 space	3/D, 3 D	1/EH3, 1 5	1/A1, 1 @	1/AY 1 *				

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December	2/PA1, 2 space	1/D, 1 D	2/Y1, 2 Y	3/S, 3 S	2/EH2, 2 4	2/EH2, 2 4	1/M, 1 M	1/B, 1 B	1/R 1 R
Deduct	2/PA1, 2 space	1/D, 1 D	1/I3, 1 #	3/D, 3 D	1/UH2, 1 7	1/UH2, 1 7	1/K, 1 K	1/PA0, 1 0	1/T 1 T
Defer	2/PA1, 2 space	1/D, 1 D	1/Y1, 1 Y	2/F, 2 F	1/ER, 1 /	1/R 1 R			
Deliver	2/PA1, 2 space	1/D, 1 D	1/UH3, 1 8	2/L, 2 L	1/I2, 1 !	1/V, 1 V	1/ER 1 /		
Demand	2/PA1, 2 space	1/D, 1 D	1/EH3, 1 5	2/M, 2 M	1/AE1, 1 9	1/AE1, 1 9	1/N, 1 N	1/N, 1 N	1/D 1 D
Departure	2/PA1, 2 space	1/D, 1 D	1/I3, 1 #	2/P, 2 P	1/AH1, 1 ;	1/R, 1 R	1/T, 1 T	1/CH, 1 C	1/R 1 R
Deposit	2/PA1, 2 space	1/D, 1 D	1/I3, 1 #	3/P, 3 P	2/AH1, 2 ;	1/UH3, 1 8	1/Z, 1 Z	1/I2, 1 !	1/T 1 T
Determine	2/PA1, 2 space	1/D, 1 D	1/I2, 1 !	3/T, 3 T	2/R, 2 R	1/R, 1 R	1/M, 1 M	1/I3, 1 #	1/N 1 N
Did	2/PA1, 2 space	2/D, 2 D	1/I, 1 "	1/D 1 D					
Difference	2/PA1, 2 space	1/D, 1 D	1/I2, 1 !	1/F, 1 F	1/R, 1 R	1/EH3, 1 5	1/N, 1 N	1/S 1 S	
Direct	1/PA1, 1 space	1/D, 1 D	1/ER, 1 /	2/EH1, 2 3	2/K, 2 K	2/PA0, 2 0	1/T 1 T		
Direction	2/PA1, 2 space	2/D, 2 D	2/ER, 2 /	1/EH1, 1 3	1/K, 1 K	1/SH, 1 >	1/UH3, 1 8	1/N 1 N	
Distance	2/PA1, 2 space	1/D, 1 D	2/I1, 2 I	1/S, 1 S	1/T, 1 T	1/EH2, 1 4	1/N, 1 N	1/S 1 S	
Divide	1/PA1, 1 space	1/D, 1 D	1/I3, 1 #	3/V, 3 V	1/AH1, 1 ;	1/UH3, 1 8	1/E1, 1 E	1/D 1 D	
Do	2/PA1, 2 space	3/D, 3 D	1/IU, 1 (	1/U 1 '					
Dollar	2/PA1, 2 space	3/D, 3 D	2/UH3, 2 8	1/AH1, 1 ;	1/L, 1 L	1/UH3, 1 8	1/R 1 R		
Down	2/PA1, 2 space	1/D, 2 D	1/UH3, 1 8	1/AH1, 1 ;	1/U1, 1 U	1/N 1 N			
East	2/PA1, 2 space	1/E, 1 .	1/Y1, 1 Y	1/S, 1 S	1/T 1 T				

Economic	1/PA1, 1 space	1/EH2, 1 4	1/K, 1 K	1/UH3, 1 8	2/N, 2 N	1/AH1, 1 ;	1/M, 1 M	1/I2, 1 !	1/K 1 K
Effective	1/PA1, 1 space	1/UH2, 1 7	3/F, 3 F	1/EH1, 1 3	1/K, 1 K	1/PAØ, 1 Ø	1/T, 1 T	1/I3, 1 #	1/V 1 V
Eight	1/PA1, 1 space	1/A1, 1 @	1/AY, 1 *	2/Y1, 2 Y	2/T 2 T				
Eighteen	1/PA1, 1 space	1/A1, 1 @	1/AY, 1 *	2/Y1, 2 Y	2/T, 2 T	2/PAØ, 2 Ø	1/E1, 1 E	1/E1, 1 E	1/N 1 N
Eighty	2/PA1, 2 space	2/A1, 2 @	1/AY, 1 *	1/Y1, 1 Y	1/D, 1 D	1/Y 1 &			
Electric	1/PA1, 1/I3,	1/UH3, 1/K	3/L,	1/EH1,	1/K,	1/PAØ,	1/T,	1/R,	1 space 1 #
	1 8 1 K	3 L	1 3	1 K	1 Ø	1 T	1 R		
Eleven	1/PA1, 1 space	1/UH3, 1 8	3/L, 3 L	1/EH1, 1 3	1/V, 1 V	1/EH3, 1 5	1/N 1 N		
Employee	1/PA1, 1 space	1/EH2, 1 4	1/M, 1 M	3/P, 3 P	2/L, 2 L	2/01, 2 0	1/I3, 1 #	1/E1, 1 E	1/E1 1 E
Enter	2/PA1, 2 space	1/EH1, 1 3	1/N, 1 N	1/T, 1 T	1/ER 1 /				
Even	2/PA1, 2 space	1/E, 1 .	1/V, 1 V	1/EH2, 1 4	1/N 1 N				
Ever	2/PA1, 2 space	2/EH1, 2 3	1/V, 1 V	1/R, 1 R	1/R 1 R				
Except	1/PA1, 1 space	1/EH2, 1 4	1/K, 1 K	2/S, 2 S	1/EH1, 1 3	1/P 1 P	1/PAØ, 1 Ø	1/T 1 T	
Exception	1/PA1, 1 space	1/EH2, 1 4	1/K, 1 K	3/S, 3 S	1/EH1, 1 3	2/P, 2 P	1/SH, 1 >	1/UH3, 1 8	1/N 1 N
Exchange	1/PA1, 1/Y1,	1/EH3, 1/N,	1/K, 1/D,	1/S, 1/J	2/T,	3/CH,	1/A1,	1/AY,	1 space 1 Y
	1 5 1 N	1 K 1 D	1 S 1 J	2 T	3 C	1 @	1 *		
Excuse *	1/PA1, 1 space	1/EH2, 1 4	1/K, 1 K	1/S, 1 S	2/K, 2 K	1/Y1, 1 Y	1/IU, 1 (	1/IU, 1 (	1/Z 2 Z
Expand	1/PA1, 1 space	1/EH3, 1 5	1/K, 1 K	3/S, 3 S	2/P, 2 P	1/AE1, 1 9	1/EH3, 1 5	1/N, 1 N	1/D 1 D

Expense	1/PA1, 1 space	1/EH3, 1 5	1/K, 1 K	3/S, 3 S	2/P, 2 P	1/EH, 1 3	1/N, 1 N	1/S 1 S	
Experience	1/PA1, 1/UH3,	1/EH3, 1/N,	1/K, 1/S	3/S,	3/P,	1/I1,	1/E,	1/Y1,	1 space 1 8
	1 5 1 N	1 K 1 S	3 S	3 P	1 I	1 .	1 Y		
Express	1/PA1, 1 space	1/EH2, 1 4	1/K, 1 K	3/S, 3 S	2/P, 2 P	1/R, 1 R	1/EH1, 1 3	1/S 1 S	
Extend	1/PA1, 1 space	1/EH2, 1 4	1/K, 1 K	3/S, 3 S	2/T, 2 T	1/EH1, 1 3	1/I3, 1 #	1/N, 1 N	1/D 1 D
Extensive	1/PA1, 1/I2,	1/EH2, 1/V	1/K,	2/S,	2/T,	1/EH1,	1/N,	1/S,	1 space 1 !
	1 4 1 V	1 K	2 S	2 T	1 3	1 N	1 S		
Face	2/PA1, 2 space	3/F, 3 F	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/S 1 S			
Far	2/PA1, 2 space	3/F, 3 F	1/AH1, 1 ;	1/UH3, 1 8	1/R 1 R				
Fast	2/PA1, 2 space	2/F, 2 F	1/AE, 1 :‡	1/EH3, 1 5	1/S, 1 S	1/T 1 T			
February	2/PA1, 1/I3,	1/F, 1/R,	2/EH1, 2/E1	1/B,	2/Y1,	1/U1,	1/EH3,	2 space 1 #	1 F 1 R
	2 3 2 E	1 B	2 Y	1 U	1 5				
Feet	2/PA1, 2 space	2/F, 2 F	1/E, 1 .	1/T 1 T					
Few	2/PA1, 2 space	3/F, 3 F	1/Y, 1 &	1/IU, 1 (	1/U1 1 U				
Fifteen	1/PA1, 1 space	1/F, 1 F	1/I1, 1 I	2/F, 2 F	2/T, 2 T	1/E1, 1 E	1/E1, 1 E	1/N 1 N	
Fifty	2/PA1, 2 space	2/F, 2 F	2/I1, 2 I	1/F, 1 F	1/T, 1 T	1/Y 1 &			
Fight	2/PA1, 2 space	2/F, 2 F	1/UH3, 1 8	1/AH2, 1 4	1/E1, 1 I	1/T 1 T			

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File	2/PA1,	3/F,	1/AH1,	1/E1,	1/UH3,	1/L		
	2 space	3 F	1 ;	1 E	1 8	1 L		
Fill	2/PA1,	3/F,	1/I1,	1/UH3,	1/L			
	2 space	3 F	1 I	1 8	1 L			
Find	2/PA1,	3/F,	1/AH1,	1/I3,	1/E1,	1/N,	1/D	
	2 space	3 F	1 ;	1 #	1 E	1 N	1 D	
Five	2/PA1,	3/F,	1/UH3,	1/AH1,	1/E1,	1/V		
	2 space	3 F	1 8	1 ;	1 E	1 V		
For	2/PA1,	2/F,	1/0,	1/R				
	2 space	2 F	1 \	1 R				
Force	2/PA1,	2/F,	1/0,	1/R,	1/S			
	2 space	2 F	1 \	1 R	1 S			
Form	2/PA1,	2/F,	1/0,	1/R,	1/M			
	2 space	2 F	1 \	1 R	1 M			
Forty	2/PA1,	2/F,	1/01,	1/R,	1/DT,	1/Y		
	2 space	2 F	1 0	1 R	1 Q	1 T		
Forward	2/PA1,	3/F,	1/01,	1/R,	1/W,	1/ER,	1/D	
	2 space	3 F	1 0	1 R	1 W	1 /	1 D	
Fourteen	1/PA1,	1/F,	1/0,	2/R,	2/T,	2/PAØ,	1/E1,	1/E1, 1/N
	1 space	1 F	1 \	2 R	2 T	2 Ø	1 E	1 E 1 N
Fourth	2/PA1,	3/F,	1/0,	1/R,	1/TH			
	2 space	3 F	1	1 R	1 =			
Friday	2/PA1,	1/F,	2/R,	1/AH1,	1/E1,	1/D,	1/A1,	1/AY
	2 space	1 F	2 R	1 ;	1 E	1 D	1 @	1 *
From	2/PA1,	3/F,	1/R,	1/UH1,	1/M			
	2 space	3 F	1 R	1 6	1 M			
Front	2/PA1,	3/F,	1/R,	1/UH1,	1/N,	1/T		
	2 space	3 F	1 R	1 6	1 N	1 T		
Future	2/PA1,	3/F,	2/Y1,	1/U1,	2/T,	1/CH,	1/ER	
	2 space	3 F	2 Y	1 U	2 T	1 C	1 /	
Gasoline	2/PA1,	1/G,	1/AE1,	1/S,	2/UH3,	3/L,	1/E,	1/N
	2 space	1 G	1 9	1 S	2 8	3 L	1 '	1 N
Glide	2/PA1,	2/G,	1/L,	1/AH1,	1/E1,	1/D		
	2 space	2 G	1 L	1 ;	1 E	1 D		
Government	2/PA1,	2/G,	2/UH1,	1/V,	1/R,	1/M,	1/EH3,	1/N, 1/T
	2 space	2 G	2 6	1 V	1 R	1 M	1 5	1 N 1 T

Grade	2/PA1, 2 space	3/G, 3 G	1/R, 1 R	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/D 1 D		
Great	2/PA1, 2 space	2/G, 2 G	1/R, 1 R	1/A1, 1 @	1/E1, 1 E	1/T 1 T			
Ground	2/PA1, 2 space	3/G, 3 G	1/R, 1 R	1/AH1, 1 ;	1/U1, 1 U	1/N, 1 N	1/D 1 D		
Guarantee	1/PA1, 1 space	1/G, 1 G	1/EH1, 1 5	1/R, 1 R	1/UH3, 1 8	2/N, 2 N	3/T, 3 T	1/E, 1 .	1/E1 1 E
Guard	2/PA1, 2 space	3/G, 3 G	1/AH1, 1 ;	1/UH3, 1 8	1/R, 1 R	1/D 1 D			
Guess	2/PA1, 2 space	3/G, 3 G	1/EH, 1 3	1/S 1 S					
Guide	2/PA1, 2 space	2/G, 2 G	1/AH1, 1 ;	1/E1, 1 E	1/D 1 D				
Had	2/PA1, 2 space	2/H, 2 H	1/AE, 1 :‡	1/EH3, 1 5	1/D 1 D				
Hair	2/PA1, 2 space	2/H, 2 H	1/A2, 1)	1/EH2, 1 4	1/R 1 R				
Hand	2/PA1, 2 space	3/H, 3 H	1/AE, 1 :‡	1/EH3, 1 5	1/N, 1 N	1/D 1 D			
Handle	2/PA1, 2 space	2/H, 2 H	2/AE1, 2 9	1/EH3, 1 5	1/N, 1 N	1/D, 1 D	1/UH3, 1 8	1/L 1 L	
Happen	2/PA1, 2 space	3/H, 3 H	2/AE1, 2 9	1/EH3, 1 5	1/P, 1 P	1/I3, 1 #	1/N 1 N		
Hardware	2/PA1, 2 space	3/H, 3 H	1/AH1, 1 ;	1/R, 1 R	1/D, 1 D	1/W, 1 W	1/EH2, 1 4	1/R 1 R	
Has	2/PA1, 2 space	2/H, 2 H	1/AE, 1 :‡	1/I3, 1 #	1/Z 1 Z				
Have	2/PA1, 2 space	2/H, 2 H	1/AE, 1 :‡	1/UH3, 1 8	1/V 1 V				
He	2/PA1, 2 space	2/H, 2 H	1/E 1 .						
Headlight	2/PA1, 2 space	2/H, 2 H	1/EH1, 1 5	2/D, 2 D	1/L, 1 L	1/UH3, 1 8	1/AH2, 1 A	1/Y1, 1 Y	1/T 1 T

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Hear	2/PA1, 2 space	2/H, 2 H	1/E, 1 .	1/R 1 R				
Heard	2/PA1, 2 space	2/H, 2 H	1/ER, 1 /	1/R, 1 R	1/D 1 D			
Heart	2/PA1, 2 space	2/H, 2 H	1/AH1, 1 ;	1/R, 1 R	1/T 1 T			
Hello	2/PA1, 2 space	3/H, 3 H	1/EH1, 1 3	1/UH3, 1 8	1/L, 1 L	1/UH3, 1 8	1/02, 1 [	2/U1 2 U
Help	2/PA1, 2 space	3/H, 3 H	1/EH1, 1 3	1/UH3, 1 8	1/L, 1 L	1/P 1 P		
Her	2/PA1, 2 space	2/H, 2 H	1/ER, 1 /	1/R 1 R				
High	2/PA1, 2 space	2/H, 2 H	1/AH1, 1 ;	1/E1 1 E				
Him	2/PA1, 2 space	2/H, 2 H	1/I1, 1 I	1/M 1 M				
Hire	2/PA1, 2 space	2/H, 2 H	1/AH1, 1 ;	1/Y1, 1 Y	1/ER 1 /			
His	2/PA1, 2 space	2/H, 2 H	1/I, 1 ”	1/Z 1 Z				
How	2/PA1, 2 space	3/H, 3 H	1/AH1, 1 ;	1/02, 1 [	1/U1 1 U			
However	2/PA1, 2 space	2/H, 2 H	1/AH1, 1 ;	1/U1, 1 U	1/EH1, 1 3	1/V, 1 V	1/R, 1 R	2/R 2 R
Hundred	2/PA1, 2 space	3/H, 3 H	1/UH1, 1 6	1/N, 1 N	1/D, 1 D	1/R, 1 R	1/EH2, 1 4	1/D 1 D
Hurry	2/PA1, 2 space	2/H, 2 H	1/ER, 1 /	1/R, 1 R	1/Y 1 &			
I	2/PA1, 2 space	1/AH1, 1 ;	1/EH3, 1 5	1/E1 1 E				
If	2/PA1, 2 space	1/I, 1 ”	1/F 1 F					
Impatient	1/PA1, 1/EH3, 2 M 1 T	1/I1, 1/N, 3 P	2/M, 1/T 2 @	3/P, 1 *	2/A1, 1 >	1/AY,	1/SH,	1 space 1 5 1 I 1 N

Imperative	1/PA1, 1/T,	1/I2, 1/I3,	2/M, 1/V	2/P,	2/EH1,	1/R,	1/EH3,	1 space 1 T	1 ! 1 #
	2 M 1 V	2 P	2 3	1 R	1 5				
Imply	1/PA1, 1 space	1/I1, 1 I	2/M, 2 M	2/P, 2 P	2/L, 2 L	1/AH1, 1 ;	1/Y 1 &		
Impossible	1/PA1, 1 space	1/I2, 1 !	2/M, 2 M	3/P, 3 P	1/AH1, 1 ;	1/S, 1 S	1/UH3, 1 8	1/B, 1 B	1/L 1 L
Impress	1/PA1, 1 space	1/I2, 1 !	1/M, 1 M	2/P, 2 P	2/R, 2 R	1/EH1, 1 3	1/S 1 S		
Improvement	1/PA1, 1/EH3,	1/I3, 1/N,	1/M, 1/T	3/P,	1/R,	2/U1,	1/V,	1/M,	1 space 1 5
	1 # 1 N	1 M 1 T	3 P	1 R	2 U	1 V	1 M		
In	2/PA1, 2 space	1/I, 1 ”	1/N 1 N						
Inch	2/PA1, 2 space	1/I1, 1 I	1/N, 1 N	1/T, 1 T	1/CH 1 C				
Include	1/PA1, 1 space	1/I3, 1 #	1/N, 1 N	3/K, 3 K	1/L, 1 L	1/IU, 1 (	1/U1, 1 U	1/D 1 D	
Inconsistent	2/PA1, 1/S,	2/I1, 1/T,	1/N, 1/EH3,	1/K, 1/N,	1/UH3, 1/T	2/N,	3/S,	1/I2,	2 space 1 S
	2 I 1 T	1 N 1 5	1 K 1 N	1 8 1 T	2 N	3 S	1 !		
Inconvenience	2/PA1, 1/N,	2/I1, 1/Y1,	1/N, 1/UH3,	1/K, 1/N,	1/UH3, 1/S	2/N,	3/V,	1/E1,	2 space 1 N
	2 I 1 Y	1 N 1 8	1 K 1 N	1 8 1 S	2 N	3 V	1 E		
Increase	1/PA1, 1 space	1/I2, 1 !	1/N, 1 N	3/K, 3 K	1/R, 1 R	1/E, 1 E	1/S 1 S		
Independent	2/PA1, 1/D,	1/I2, 1/I3,	1/N, 1/N,	1/D, 1/T	1/Y1,	3/P,	1/EH1,	1/N,	2 space 1 D
	1 ! 1 #	1 N 1 N	1 D 1 T	1 Y	3 P	1 3	1 N		
Indicate	2/PA1, 2 space	2/I2, 2 !	1/N, 1 N	1/D, 1 D	1/I3, 1 #	1/K, 1 K	1/A1, 1 @	1/AY, 1 *	1/T 1 T

Inferior	1/PA1, 1 space	1/I2, 1 !	1/N, 1 N	3/F, 3 F	2/E1, 2 E	1/R, 1 R	1/Y, 1 &	1/ER 1 /	
Influence	2/PA1, 2 space	2/I1, 2 I	1/N, 1 N	2/F, 2 F	1/L, 1 L	1/U1, 1 U	1/I3, 1 #	1/N, 1 N	1/S 1 S
Inform	1/PA1, 1 space	1/I2, 1 !	1/N, 1 N	3/F, 3 F	1/0, 1 \	1/R, 1 R	2/M 1 M		
Information	2/PA1, 2/SH,	1/I2, 1/UH3,	1/N, 1/N	1/F,	2/R,	3/M,	1/A1,	1/AY,	2 space 2 >
	1 ! 1 8	1 N 1 N	1 F	2 R	3 M	1 @	1 *		
Initial	1/PA1, 1 space	1/I2, 1 !	2/N, 2 N	2/I1, 2 I	1/SH, 1 >	1/UH3, 1 8	1/L 1 L		
Inquire	1/PA1, 1 space	1/I3, 1 #	2/N, 2 N	3/K, 3 K	1/W, 1 W	1/AH2, 1 A	1/E1, 1 E	1/R 1 R	
Insert	1/PA1, 1 space	1/I2, 1 !	2/N, 2 N	2/S, 2 S	1/ER, 1 /	1/R, 1 R	1/T 1 T		
Inside	2/PA1, 2 space	1/I3, 1 #	1/N, 1 N	2/S, 2 S	1/AH1, 1 ;	1/E1, 1 E	1/D 1 D		
Instead	1/PA1, 1 space	1/I2, 1 !	2/N, 2 N	2/S, 2 S	1/T, 1 T	1/EH, 1 3	1/D 1 D		
Instruct	1/PA1, 1 space	1/I2, 1 !	1/N, 1 N	3/S, 3 S	2/T, 2 T	1/R, 1 R	1/UH1, 1 6	1/K, 1 K	1/T 1 T
Insufficient	2/PA1, 1/EH3,	1/I2, 1/N,	2/N, 1/T	1/S,	1/UH3,	2/F,	1/I2,	1/SH	2 space 1 3
	1 ! 1 N	2 N 1 T	1 S	1 8	2 F	1 !	1 >		
Insurance	1/PA1, 1 space	1/I1, 1 I	1/N, 1 N	3/SH, 3 >	1/R, 1 R	1/R, 1 R	1/EH3, 1 5	1/N, 1 N	1/S 1 S
Intelligibility	1/PA1, 2/J,	1/I2, 1/UH3,	2/N, 2/B,	1/T, 1/I2,	1/EH3, 1/L,	2/L, 1/I3,	1/UH3, 1/T,	2/D, 2/Y	1 space 2 J
	1 ! 1 8	2 N 2 B	1 T 1 !	1 3 1 L	2 L 1 #	1 8 1 T	2 D 2 Y		
Intend	1/PA1, 1 space	1/I2, 1 !	2/N, 2 N	3/T, 3 T	1/EH1, 1 3	1/I3, 1 #	1/N, 1 N	1/D 1 D	
Interest	2/PA1, 2 space	2/I2, 2 !	2/N, 2 N	1/T, 1 T	1/R, 1 R	1/EH2, 1 4	1/S, 1 S	1/T 1 T	

Interrupt	1/PA1, 1 space	1/I2, 1 !	2/N, 2 N	1/T, 1 T	1/ER, 1 /	2/UH1, 2 6	2/P, 2 P	2/T 2 T	
Into	1/PA1, 1 space	1/I1, 1 I	1/N, 1 N	2/T, 2 T	1/U 1 '				
Introduced	1/PA1, 1/U1,	1/I2, 1/S,	1/N, 1/T	1/T,	2/R,	1/UH3,	2/D,	1/IU,	1 space 1 U
	1 ! 1 S	1 N 1 T	1 T	2 R	1 8	2 D	1 (		
Investigate	1/PA1, 1/G,	1/I2, 1/A2,	2/N, 2/Y1,	2/V, 2/T	2/EH1,	1/S,	1/T,	1/I3,	1 space 1 G
	1 @ 1)	2 N 2 Y	2 V 2 T	2 3	1 S	1 %	1 #		
Is	1/PA1, 1 space	1/I, 1 "	2/Z 2 Z						
It	1/PA1, 1 space	1/I1, 1 I	1/T 1 T						
Jacket	2/PA1, 2 space	2/D, 2 D	2/J, 2 J	1/AE1, 1 9	1/EH3, 1 5	1/K, 1 K	1/EH3, 1 5	1/T 1 T	
January	2/PA1, 1/EH3,	2/D, 1/I3,	1/J, 1/R,	2/AE1, 2/E1	1/I3,	1/N,	2/Y1,	1/U1,	2 space 2 5
	2 D 1 #	1 J 1 R	2 9 2 E	1 #	1 N	2 Y	1 U		
Joint	2/PA1, 2 space	2/D, 2 D	2/J, 2 J	1/01, 1 0	1/I3, 1 #	1/AY, 1 *	2/N, 2 N	1/T 1 T	
July	1/PA1, 1 space	1/D, 1 D	1/J, 1 J	1/IU, 1 (	3/L, 3 L	1/AH1, 1 ;	1/E1 1 E		
June	1/PA1, 1 space	2/D, 2 D	3/J, 3 J	1/IU, 1 (	1/U, 1 '	1/N 1 N			
Justice	2/PA1, 2 space	2/D, 2 D	2/J, 2 J	1/UH1, 1 6	1/S, 1 S	1/T, 1 T	1/I3, 1 #	1/S 1 S	
Keep	2/PA1, 2 space	2/K, 2 K	1/E1, 1 E	1/Y, 1 &	1/P 1 P				
Kind	2/PA1, 2 space	2/K, 2 K	1/AH1, 1 ;	1/E1, 1 E	1/N, 1 N	1/D 1 D			

Knew	2/PA1, 2 space	1/N, 1 N	1/IU, 1 (	1/U1 1 U					
Know	2/PA1, 2 space	1/N, 1 N	1/UH3, 1 8	1/01, 1 0	1/U1 1 U				
Knowledge	2/PA1, 2 space	2/N, 2 N	1/AH1, 1 ;	1/L, 1 L	1/EH3, 1 5	1/D, 1 D	1/J 1 J		
Lead *	2/PA1, 2 space	2/L, 2 L	1/EH1, 1 3	1/I3, 1 #	1/D 1 D				
Least	1/PA1, 1 space	2/L, 2 L	1/E1, 1 E	1/Y, 1 &	1/S, 1 S	1/T 1 T			
Leave	1/PA1, 1 space	2/L, 2 L	2/E1, 2 E	1/Y1, 1 Y	1/V 1 V				
Leeway	2/PA1, 2 space	2/L, 2 L	2/E1, 2 E	1/W, 1 W	1/A1, 1 @	1/AY 1 *			
Left	2/PA1, 2 space	2/L, 2 L	1/EH2, 1 4	1/UH3, 1 8	1/F, 1 F	1/T 1 T			
Life	2/PA1, 2 space	2/L, 2 L	1/AH1, 1 ;	1/E1, 1 E	1/F 1 F				
Light	2/PA1, 2 space	2/L, 2 L	1/UH3, 1 8	1/AH2, 1 A	1/Y1, 1 Y	1/T 1 T			
Limit	1/PA1, 1 space	2/L, 2 L	1/I2, 1 !	1/M, 1 M	1/I3, 1 #	1/T 1 T			
List	2/PA1, 2 space	1/L, 1 L	1/I1, 1 I	1/S, 1 S	1/T 1 T				
Live	2/PA1, 2 space	2/L, 2 L	1/I1, 1 I	1/V 1 V					
Location	2/PA1, 1/UH3,	1/L, 1/N	1/UH3,	1/02,	2/K,	1/A2,	1/Y1,	1/SH	2 space 1 8
	1 L 1 N	1 8	1 [	2 K	1)	1 Y	2 >		
Made	1/PA1, 1 space	1/M, 1 M	2/A1, 2 @	1/AY, 1 *	1/Y1, 1 Y	1/D 1 D			
Manage	2/PA1, 2 space	2/M, 2 M	1/AE1, 1 9	1/EH3, 1 5	1/N, 1 N	1/I3, 1 #	1/D, 1 D	1/J 1 J	

March	2/PA1, 2 space	2/M, 2 M	1/AH1, 1 ;	1/UH3, 1 8	1/R, 1 R	1/T, 1 T	1/CH 1 C		
Mark	2/PA1, 2 space	2/M, 2 M	1/AH1, 1 ;	1/UH3, 1 8	1/R, 1 R	1/K 1 K			
Material	2/PA1, 2 space	1/M, 1 M	1/EH3, 1 5	3/T, 3 T	2/I1, 2 I	1/R, 1 R	1/E1, 1 E	1/UH3, 1 8	1/L 1 L
Maximum	2/PA1, 2 space	2/M, 2 M	1/AE1, 1 9	2/K, 2 K	1/S, 1 S	1/EH3, 1 5	1/M, 1 M	1/UH3, 1 8	1/M 1 M
May	2/PA1, 2 space	1/M, 1 M	2/EH3, 2 5	1/A1, 1 @	1/AY 1 *				
Measurement	2/PA1, 2 space	2/M, 2 M	2/EH1, 2 3	1/ZH, 1 X	1/R, 1 R	1/M, 1 M	1/EH3, 1 5	1/N, 1 N	1/T 1 T
Mechanic	1/PA1, 1 space	1/M, 1 M	1/EH2, 1 4	3/K, 3 K	1/AE1, 1 9	1/EH3, 1 5	1/N, 1 N	1/T 1 T	
Medium	2/PA1, 2 space	2/M, 2 M	2/E1, 2 E	1/D, 1 D	1/E1, 1 E	1/UH2, 1 7	1/M 1 M		
Member	1/PA1, 1 space	2/M, 2 M	2/EH1, 2 3	1/M, 1 M	1/B, 1 B	1/ER 1 /			
Men	2/PA1, 2 space	2/M, 2 M	1/EH1, 1 3	1/I3, 1 #	1/N 1 N				
Merge	2/PA1, 2 space	2/M, 2 M	1/ER, 1 /	1/R, 1 R	1/D, 1 D	1/J 1 J			
Mile	1/PA1, 1 space	2/M, 2 M	1/AH1, 1 ;	1/I3, 1 #	1/UH3, 1 8	1/L 1 L			
Million	2/PA1, 2 space	1/M, 1 M	2/I1, 2 I	1/L, 1 L	1/Y1, 1 Y	1/UH3, 1 8	1/N 1 N		
Mind	2/PA1, 2 space	2/M, 2 M	1/AH1, 1 ;	1/E1, 1 E	1/N, 1 N	1/D 1 D			
Minutes	2/PA1, 2 space	2/M, 2 M	1/I1, 1 I	1/N, 1 N	1/I3, 1 #	1/T, 1 T	1/S 1 S		
Mistake	2/PA1, 2 space	1/M, 1 M	1/I3, 1 #	2/S, 2 S	2/T, 2 T	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/K 1 K
Monday	2/PA1, 2 space	2/M, 2 M	1/UH1, 1 6	1/N, 1 N	1/D, 1 D	1/A1, 1 @	1/AY 1 *		
Month	2/PA1, 2 space	2/M, 2 M	1/UH1, 1 6	2/N, 1 N	1/TH 1 =				

Mr.	2/PA1, 2 space	2/M, 2 M	2/I2, 2 !	1/S, 1 S	1/T, 1 T	1/ER 1 /			
Mrs.	1/PA1, 1 space	1/M, 1 M	2/I1, 2 I	1/S, 1 S	1/I2, 1 !	1/Z 1 Z			
Much	1/PA1, 1 space	2/M, 2 M	1/UH1, 1 6	1/T, 1 T	1/CH 1 C				
Must	1/PA1, 1 space	2/M, 2 M	1/UH1, 1 6	1/S, 1 S	1/T 1 T				
Nation	2/PA1, 2 space	1/N, 1 N	2/A1, 1 @	1/AY, 1 *	1/SH, 1 >	1/EH2, 1 4	1/N 1 N		
Necessitate	2/PA1, 1/T,	1/N, 1/A1,	1/EH3, 1/AY,	2/S, 1/T	2/EH1,	1/S,	1/I3,	2 space 1 T	1 N 1 @
	1 5 1 *	2 S 1 T	1 3	1 S	1 #				
Never	2/PA1, 2 space	1/N, 1 N	2/EH1, 2 3	1/V, 1 V	1/ER 1 /				
Newspaper	2/PA1, 1/AY,	1/N, 1/P,	2/IU, 1/R	2/U1,	2/Z,	1/P,	1/A1,	2 space 1 *	1 N 1 P
	2 (1 R	2 U	2 Z	1 P	1 @				
Nine	2/PA1, 2 space	2/N, 2 N	1/AH1, 1 ;	1/I3, 1 #	1/Y, 1 Y	1/N 1 N			
Nobody	2/PA1, 2 space	1/N, 1 N	2/01, 2 0	1/B, 1 B	1/UH1, 1 6	1/D, 1 D	1/Y 1 &		
North	2/PA1, 2 space	2/N, 2 N	1/0, 1 \	1/R, 1 R	1/TH 1 =				
Not	2/PA1, 2 space	1/N, 2 N	2/AH1, 2 ;	1/T 1 T					
November	1/PA1, 1/B,	1/N, 1/ER	1/01,	3/V,	2/EH2,	1/EHb,	1/M,	1 space 1 B	1 N 1 /
	1 0	3 V	2 4	1 5	1 M				
Now	2/PA1, 2 space	2/N, 2 N	2/UH3, 2 8	1/AH1, 1 ;	1/02, 1 [	1/U1 1 U			
Number	2/PA1, 2 space	1/N, 1 N	2/UH1, 2 6	1/M, 1 M	1/B, 1 B	1/ER 1 /			

Objected	1/PA1, 1/PAØ,	1/UH2, 1/T,	1/B, 1/I3,	2/D, 1/D	2/J,	1/EH1,	1/K,	1 space 1 Ø	1 7 1 T
	1 B 1 #	2 D 1 D	2 J	1 3	1 K				
Observe	1/PA1, 1 space	1/UH2, 1 7	2/B, 2 B	1/Z, 1 Z	1/ER, 1 /	2/R, 2 R	1/V 1 V		
O'Clock	1/PA1, 1 space	1/01, 1 0	3/K, 3 K	1/L, 1 L	1/AH1, 1 ;	1/K 1 K			
October	1/PA1, 1/U1,	1/AH1, 1/B,	1/K, 1/R	2/PAØ,	3/T,	1/02,	1 space 1 U	1 ; 1 B	1 K 1 R
	2 Ø	3 T	1 [						
On	2/PA1, 2 space	1/AH, 1]	1/UH3, 1 8	1/N, 1 N	1/N 1 N				
Once	2/PA1, 2 space	2/W, 2 W	1/UH1, 1 6	1/UH3, 1 8	1/N, 1 N	1/T, 1 T	1/S 1 S		
One	2/PA1, 2 space	2/W, 2 W	1/UH, 1 6	1/N 1 N					
Operate	2/PA1, 2 space	2/AH1, 2 ;	1/P, 1 P	1/ER, 1 /	1/A1, 1 @	1/AY, 1 *	1/T 1 T		
Our(s)	2/PA1, 2 space	1/AH1, 1 ;	1/U1, 1 U	1/ER, 1 /	(1/Z) (1 Z)				
Over	2/PA1, 2 space	1/01, 1 0	1/U1, 1 U	1/V, 1 V	1/ER 1 /				
Pacific	1/PA1, 2 space	1/P, 1 P	2/EH2, 2 4	3/S, 3 S	1/I1, 1 I	1/F, 1 F	1/I3, 1 #	1/K 1 K	
Page	2/PA1, 2 space	1/P, 1 P	2/A1, 2 @	1/AY, 1 *	1/AY, 1 *	1/D1, 1 D	1/J 1 J		
Paper	2/PA1, 2 space	1/P, 1 P	2/A1, 2 @	1/AY, 1 *	1/P, 1 P	1/ER 1 /			
Parallel	2/PA1, 1/UH3,	2/R, 1/L	2/EH1,	1/R,	2/UH3,	1/L,	1/EH3,	2 space 1 8	2 P 1 L
	2 3	1 R	2 8	1 L	1 5				
Part(s)	2/PA1, 2 space	2/P, 2 P	1/AH1, 1 ;	1/R, 1 R	1/T, 1 T	(1/S) (1 S)			

Pass	2/PA1, 2 space	2/P, 2 P	1/AE, 1 :‡	1/EH3, 1 5	1/S 1 S				
Pattern	2/PA1, 2 space	2/P, 2 P	1/AE1, 1 9	1/EH3, 1 5	1/DT, 1 Q	1/ER, 1 /	1/N 1 N		
Pavement	2/PA1, 1/N,	1/P, 1/T	2/A1,	1/AY,	1/V,	1/M,	1/EH3,	2 space 1 N	1 P 1 T
	2 @	1 *	1 V	1 M	1 5				
Pay	2/PA1, 2 space	2/P, 2 P	1/EH3, 1 5	1/A1, 1 @	1/AY 1 *				
Percent	1/PA1, 1 space	1/P, 1 P	1/R, 1 R	3/S, 3 S	1/EH1, 1 3	1/N, 1 N	1/T 1 T		
Percentage	1/PA1, 1/I3,	1/P, 1/D,	1/R, 1/J	3/S,	1/EH1,	1/N,	1/T,	1 space 1 #	1 P 1 D
	1 R 1 J	3 S	1 3	1 N	1 T				
Performance	1/PA1, 1/EH3,	1/P, 1/N,	1/R, 1/S	3/F,	1/02,	1/R,	1/M,	1 space 1 #	1 P 1 P
	1 R 1 R	3 F	1 [	1 R	1 M				
Period	2/PA1, 2 space	2/P, 2 P	2/I2, 2 !	1/R, 1 R	1/E1, 1 E	1/UH3, 1 8	1/D 1 D		
Pertain	1/PA1, 1/N	2/P,	1/ER,	3/T,	1/A1,	1/AY,	1/Y1,	1 space 1 N	2 P
	1 /	3 T	1 @	1 *	1 Y				
Phone	2/PA1, 2 space	2/F, 2 F	1/0, 1 \	1/U1, 1 U	1/N 1 N				
Phrase	2/PA1, 2 space	2/F, 2 F	1/R, 1 R	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/Z 1 Z		
Place	2/PA1, 2 space	2/P, 2 P	1/L, 1 L	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/S 1 S		
Placement	2/PA1, 2 space	2/P, 2 P	2/L, 2 L	1/A2, 1)	1/AY, 1 *	1/S, 1 S	1/M, 1 M	1/EH3, 1 5	1/N, 1 N
	1/T 1 T								

‡ When using the INPUT statement, this character must be shifted.

Plan	2/PA1, 2 space	2/P, 2 P	2/L, 2 L	1/AE1, 1 9	1/EH3, 1 5	1/N 1 N			
Please	2/PA1, 2 space	2/P, 2 P	2/L, 2 L	1/E1, 1 E	1/E1, 1 E	1/Z 1 Z			
P. M.	1/PA1, 1 space	1/P, 1 P	1/E1, 1 E	2/E1, 2 E	2/PAØ, 2 Ø	2/EH1, 2 3	1/EH3, 1 5	1/UH3, 1 8	1/M 1 M
Policy	2/PA1, 2 space	2/P, 2 P	1/AH1, 1 ;	1/L, 1 L	1/I3, 1 #	1/S, 1 S	1/Y 1 &		
Position	1/PA1, 1 space	1/P, 1 P	2/UH3, 2 8	2/Z, 2 Z	1/I1, 1 I	1/SH, 1 >	1/UH3, 1 8	1/N 1 N	
Possible	2/PA1, 2 space	2/P, 2 P	1/AH1, 1 ;	1/S, 1 S	1/UH3, 1 8	1/B, 1 B	1/L 1 L		
Postage	2/PA1, 2 space	2/P, 2 P	1/01, 1 0	1/S, 1 S	1/T, 1 T	1/I3, 1 #	1/D, 1 D	1/J 1 J	
Potential	1/PA1, 1 space	1/P, 1 P	2/02, 1 [	2/T, 2 T	2/EH1, 2 3	1/N, 1 N	1/SH, 1 >	1/UH3, 1 8	1/L 1 L
Practice	2/PA1, 2 space	1/P, 1 P	2/R, 2 R	1/AE1, 1 9	2/K, 2 K	1/PAØ, 1 Ø	1/T, 1 T	1/I3, 1 #	1/S 1 S
Preference	2/PA1, 2 space	2/P, 2 P	2/R, 2 R	1/EH2, 1 4	1/V, 1 V	1/R, 1 R	1/EH3, 1 5	1/N, 1 N	1/S 1 S
Preparation	2/PA1, 1/UH3,	1/P, 1/N	1/R,	1/EH3,	2/P,	1/ER,	2/A1,	1/AY,	1/SH
	2 space 1 8	1 P 1 N	1 R	1 5	2 P	1 /	2 @	1 *	1 >
Prepare	2/PA1, 2 space	2/P, 2 P	1/R, 1 R	1/EH3, 1 5	3/P, 3 P	1/EH3, 1 5	1/A1, 1 @	1/R 1 R	
Present	1/PA1, 1 space	1/P, 1 P	1/R, 1 R	2/I3, 2 #	2/Z, 2 Z	1/EH2, 1 4	1/EH2, 1 4	1/N 1 N	1/T 1 T
Pressure	2/PA1, 2 space	1/P, 1 P	2/R, 2 R	1/EH1, 1 3	1/SH, 1 >	1/ER 1 /			
Price	2/PA1, 2 space	2/P, 2 P	1/R, 1 R	1/UH3, 1 8	1/AH2, 1 A	1/E1, 1 E	1/S 1 S		
Print	2/PA1, 2 space	2/P, 2 P	1/R, 1 R	1/I1, 1 I	1/N, 1 N	1/T 1 T			
Problem(s)	2/PA1, 2 space	2/P, 2 P	2/R, 2 R	1/AH1, 1 ;	1/B, 1 B	1/L, 1 L	1/EH3, 1 5	1/M, 1 M	(1/Z) (1 Z)

Produce	2/PA1, 2 space	1/P, 1 P	1/R, 1 R	2/UH3, 2 8	1/D, 1 D	1/IU, 1 (	1/U1, 1 U	1/S 1 S	
Program	2/PA1, 2 space	1/P, 1 P	2/R, 2 R	1/01, 1 0	1/G, 1 G	1/R, 1 R	1/AE1, 1 9	1/EH3, 1 5	1/M 1 M
Progress	2/PA1, 2 space	2/P, 2 P	2/R, 2 R	2/AH1, 2 ;	1/G, 1 G	1/R, 1 R	1/EH1, 1 3	1/S 1 S	
Public	2/PA1, 2 space	1/P, 1 P	2/UH1, 2 6	1/B, 1 B	1/L, 1 L	1/I3, 1 #	1/K 1 K		
Pupil	2/PA1, 2 space	1/P, 1 P	2/Y1, 2 Y	2/U1, 2 U	1/P, 1 P	1/UH3, 1 8	1/L 1 L		
Quantity	2/PA1, 2 space	2/K, 2 K	1/W, 1 W	2/AH2, 2 A	1/EH3, 1 5	2/N, 2 N	1/DT, 1 Q	1/I2, 1 !	1/DT, 1 Q
	1/Y 1 &								
Quart	2/PA1, 2 space	2/K, 2 K	2/W, 2 W	1/02, 1 [	1/R, 1 R	1/T 1 T			
Question	1/PA1, 1 space	2/K, 2 K	2/W, 2 W	1/EH1, 1 3	1/S, 1 S	2/T, 2 T	2/CH, 2 C	2/UH3, 2 8	1/N 1 N
Quick	2/PA1, 2 space	2/K, 2 K	1/W, 1 W	1/I1, 1 I	1/K 1 K				
Quiet	2/PA1, 2 space	2/K, 2 K	1/W, 1 W	1/AH1, 1 ;	1/Y, 1 &	1/EH3, 1 5	1/T 1 T		
Quite	2/PA1, 2 space	2/K, 2 K	1/W, 1 W	1/UH1, 1 6	1/Y, 1 &	1/T 1 T			
Quotation	2/PA1, 2 space	1/K, 1 K	1/W, 1 W	1/01, 1 0	3/T, 3 T	2/A2, 2)	1/Y, 1 &	1/SH, 1 >	1/UH3, 1 8
	1/N 1 N								
Quote	2/PA1, 2 space	2/K, 2 K	1/W, 1 W	1/01, 1 0	1/U1, 1 U	1/T 1 T			
Range	1/PA1, 1 space	1/R, 1 R	2/A1, 2 @	1/AY, 1 *	1/I3, 1 #	1/N, 1 N	1/D, 1 D	1/J 1 J	

Rapid	2/PA1, 2 space	2/R, 2 R	1/AE1, 1 9	1/P, 1 P	1/I3, 1 #	1/D 1 D			
Reaction	1/PA1, 1 space	1/R, 1 R	2/E1, 2 E	1/AE1, 1 9	1/EH3, 1 5	1/K, 1 K	1/SH, 1 >	1/UH3, 1 8	1/N 1 N
Read *	2/PA1, 2 space	2/R, 2 R	1/EH3, 1 5	1/I3, 1 #	1/D 1 D				
Read *	2/PA1, 2 space	2/R, 2 R	1/E1, 1 E	1/E1, 1 E	1/D 1 D				
Receive	1/PA1, 1 space	1/R, 1 R	1/E1, 1 E	3/S, 3 S	1/E, 1 .	1/E1, 1 E	1/V 1 V		
Recognition	2/PA1, 1/SH,	1/R, 1/UH3,	1/EH3, 1/N	2/K,	1/I2,	2/G,	3/N,	1/I2,	2 space 1 >
	1 R 1 8	1 5 1 N	2 K	1 !	2 G	3 N	1 !		
Recommend	2/PA1, 2 space	1/R, 1 R	1/EH3, 1 5	2/K, 2 K	1/UH3, 1 8	3/M, 3 M	1/EH, 1 3	1/N, 1 N	1/D 1 D
Recommendation	2/PA1, 1/A1,	2/R, 1/Ay,	1/EH3, 1/SH,	2/K, 1/UH3,	1/EH2, 1/N	1/M,	1/EH2,	1/N,	3/D
	2 space 1 @	2 R 1 *	1 5 1 >	2 K 1 8	1 4 1 N	1 M	1 4	1 N	3 D
Refund	2/PA1, 2 space	2/R, 2 R	1/E1, 1 E	1/F, 1 F	1/UH3, 1 8	1/UH1, 1 6	1/N, 1 N	1/D 1 D	
Register	2/PA1, 2 space	2/R, 2 R	1/EH2, 1 4	1/D, 1 D	1/J, 1 J	1/I3, 1 #	1/S, 1 S	1/T, 1 T	1/R 1 R
Release(d)	1/PA1, 1 space	1/R, 1 R	1/E1, 1 E	2/L, 2 L	1/E1, 1 E	1/Y1, 1 Y	1/S, 1 S	(1/T) (1 T)	
Remark	2/PA1, 2 space	1/R, 1 R	1/E1, 1 E	3/M, 3 M	1/AH1, 1 ;	1/R, 1 R	1/K 1 K		
Remember	2/PA1, 2 space	1/R, 1 R	1/E1, 1 E	3/M, 3 M	2/EH3, 2 5	2/UH3, 2 8	1/M, 1 M	1/B, 1 B	1/R 1 R
Remind	2/PA1, 2 space	1/R, 1 R	1/E1, 1 E	3/M, 3 M	1/AH1, 1 ;	1/E1, 1 E	1/N, 1 N	1/D 1 D	
Reorganize	2/PA1, 1/Y1,	1/R, 1/Z	1/E1,	3/01,	1/R,	2/G,	1/UH3,	1/N,	1/AH1,
	2 space 1 Y	1 R 1 Z	1 E	3 0	1 R	2 G	1 8	1 N	1 ;

Repeat	1/PA1, 1 space	1/R, 1 R	1/E1, 1 E	3/P, 3 P	1/E1, 1 E	1/Y1, 1 Y	1/T 1 T		
Replace	1/PA1, 1 space	1/R, 1 R	1/E1, 1 E	3/P, 3 P	1/L, 1 L	1/A1, 1 @	1/AY, 1 *	1/S 1 S	
Replacement	1/PA1, 1/EH3,	1/R, 1/N,	1/E1, 1/T	3/P,	1/L,	2/A1,	1/Y1,	1/S,	1/M
	1 space 1 5	1 R 1 N	1 E 1 T	3 P	1 L	2 @	1 Y	2 S	1 M
Report	1/PA1, 1 space	1/R, 1 R	1/E1, 1 E	3/P, 3 P	1/01, 1 0	1/R, 1 R	1/T 1 T		
Represent	2/PA1, 2 space	2/R, 2 R	1/EH3, 1 5	1/P, 1 P	1/R, 1 R	1/I3, 1 #	3/Z, 3 Z	1/EH1, 1 3	1/N, 1 N
	1/T 1 T								
Request	1/PA1, 1 space	1/R, 1 R	1/I3, 1 #	3/K, 3 K	1/W, 1 W	1/EH1, 1 3	1/S, 1 S	1/T 1 T	
Return	1/PA1, 1 space	1/R, 1 R	1/E1, 1 E	3/T, 3 T	1/ER, 1 /	1/R, 1 R	1/N 1 N		
Right	2/PA1, 2 space	2/R, 2 R	1/AH2, 1 A	1/UH3, 1 8	1/E1, 1 E	1/T 1 T			
Rotation	1/PA1, 1 space	1/R, 1 R	1/02, 1 [	3/T, 3 T	1/A1, 1 @	1/AY, 1 *	1/SH, 1 >	1/UH3, 1 8	1/N 1 N
Runway	2/PA1, 2 space	2/R, 2 R	1/UH1, 1 6	1/N, 1 N	1/W, 1 W	1/A1, 1 @	1/AY 1 *		
Said	2/PA1, 2 space	3/S, 3 S	1/EH1, 1 3	1/I3, 1 #	1/D 1 D				
Same	2/PA1, 2 space	2/S, 2 S	1/EH3, 1 5	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/M 1 M		
Saturday	2/PA1, 2 space	2/S, 2 S	1/AE1, 1 9	2/EH3, 2 5	1/DT, 1 Q	1/R, 1 R	1/D, 1 D	1/A1, 1 @	1/AY 1 *
Save	2/PA1, 2 space	2/S, 2 S	1/EH3, 1 5	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/V 1 V		
Say	2/PA1, 2 space	2/S, 2 S	1/EH3, 1 5	1/A1, 1 @	1/AY 1 *				
School	2/PA1, 2 space	2/S, 2 S	2/K, 2 K	1/U1, 1 U	1/U1, 1 U	1/L 1 L			

Screen	2/PA1, 2 space	2/S, 2 S	2/K, 2 K	2/R, 2 R	1/E1, 1 E	1/E1, 1 E	1/N 1 N		
Search	2/PA1, 2 space	2/S, 2 S	1/ER, 1 /	1/R, 1 R	1/T, 1 T	1/CH 1 C			
Season	2/PA1, 2 space	3/S, 3 S	1/E, 1 .	1/Z, 1 Z	1/EH2, 1 4	1/N 1 N			
Second(s)	2/PA1, 2 space	1/S, 1 S	2/EH1, 2 3	1/K, 1 K	1/UH2, 1 7	1/N, 1 N	1/T, 1 T	(1/S) (1 S)	
Section	2/PA1, 2 space	1/S, 1 S	2/EH1, 2 3	2/K, 2 K	1/SH, 1 >	1/UH3, 1 8	1/N 1 N		
Secure	1/PA1, 1 space	1/S, 1 S	1/I3, 1 #	2/K, 2 K	2/Y1, 2 Y	1/ER, 1 /	1/R 1 R		
See	2/PA1, 2 space	2/S, 2 S	1/E1, 1 E	1/E1 1 E					
Seen	2/PA1, 2 space	2/S, 2 S	1/E1, 1 E	1/E1, 1 E	1/N 1 N				
Select	1/PA1, 1 space	1/S, 1 S	2/UH3, 2 8	2/L, 1 L	1/UH3, 1 8	1/EH1, 1 3	2/K, 2 K	1/T 1 T	
Self	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/UH3, 1 8	1/L, 1 L	1/F 1 F			
Sell	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/UH3, 1 8	1/L 1 L				
Send	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/I3, 1 #	1/N, 1 N	1/D 1 D			
Sent	2/PA1, 2 space	2/S, 2 S	2/EH3, 2 5	1/EH1, 1 3	1/N, 1 N	1/T 1 T			
Separate	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/P, 1 P	1/R, 1 R	1/EH3, 1 5	1/T 1 T		
Separation	2/PA1, 2 space	1/S, 1 S	1/EH1, 1 3	2/P, 2 P	1/ER, 1 /	2/A1, 2 @	1/AY, 1 *	1/SH, 1 >	1/UH3, 1 8
	1/N 1 N								
September	1/PA1, 1 space	1/S, 1 S	1/EH2, 1 4	2/P, 2 P	3/T, 3 T	1/EH1, 1 3	1/M, 1 M	1/B, 1 B	1/R 1 R
Serve	2/PA1, 2 space	1/S, 1 S	2/ER, 2 /	1/R, 1 R	1/V 1 V				

Seven	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/V, 1 V	1/EH3, 1 5	1/N 1 N			
Seventeen	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/V, 1 V	1/EH3, 1 5	2/N, 2 N	2/T, 2 T	1/E1, 1 E	1/E1, 1 E
	1/N 1 N								
Seventy	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/V, 1 V	1/EH3, 1 5	1/N, 1 N	1/D, 1 D	1/Y 1 &	
Several	2/PA1, 2 space	1/S, 1 S	2/EH1, 2 3	1/V, 1 V	1/R, 1 R	1/UH3, 1 8	1/L 1 L		
She	2/PA1, 2 space	2/SH, 2 >	1/E1, 1 E	1/E1 1 E					
Shipment	2/PA1, 2 space	2/SH, 2 >	1/I2, 1 !	1/P, 1 P	1/M, 1 M	1/EH3, 1 5	1/N, 1 N	1/T 1 T	
Short	2/PA1, 2 space	2/SH, 2 >	1/01, 1 0	1/R, 1 R	1/T 1 T				
Shortage	2/PA1, 2 space	2/SH, 2 >	1/02, 1 [	1/R, 1 R	1/T, 1 T	1/I2, 1 !	1/D, 1 D	1/J 1 J	
Should	2/PA1, 2 space	2/SH, 2 >	1/Iu, 1 (	1/Iu, 1 (	1/IU, 1 (	1/D 1 D			
Side	2/PA1, 2 space	2/S, 2 S	1/AH1, 1 ;	1/E1, 1 E	1/D 1 D				
Sign	2/PA1, 2 space	2/S, 2 S	1/AH1, 1 ;	1/I3, 1 #	1/E1, 1 E	1/N 1 N			
Signal	2/PA1, 2 space	2/S, 2 S	2/I1, 2 I	1/G, 1 G	1/N, 1 N	1/UH3, 1 8	1/L 1 L		
Signature	2/PA1, 2 space	3/S, 3 S	2/I1, 2 I	1/G, 1 G	1/N, 1 N	1/I3, 1 #	1/T, 1 T	1/CH, 1 C	1/ER 1 /
Significant	1/PA1, 1/EH3,	1/S, 1/N,	1/I2, 1/T	2/G,	3/N	1/I2,	1/F,	1/I3,	1/K,
	1 space 1 5	1 S 1 N	1 ! 1 T	2 G	3 N	1 !	1 F	1 #	1 K
Since	2/PA1, 2 space	2/S, 2 S	1/I, 1 ”	1/N, 1 N	1/S 1 S				
Single	2/PA1, 2 space	2/S, 2 S	2/I1, 2 I	1/NG, 1 +	1/G, 1 G	1/L 1 L			

Situation	2/PA1, 1/AY,	2/S, 1/SH,	1/I2, 1/UH3,	1/T, 1/N	1/CH,	1/IU,	2/U1,	1/A2,	2 space 1 *
	2 S 1 >	1 ! 1 *	1 T 1 N	1 C	1 (	2 U	1)		
Six	2/PA1, 2 space	2/S, 2 S	1/I1, 1 I	1/K, 1 K	1/S 1 S				
Sixteen	2/PA1, 2 space	1/S, 1 S	1/I1, 1 I	2/K, 2 K	2/S, 2 S	2/T, 2 T	1/E1, 1 E	1/E1, 1 E	1/N 1 N
Sixty	2/PA1, 2 space	2/S, 2 S	1/I1, 1 I	1/K, 1 K	1/S, 1 S	1/T, 1 T	1/Y 1 &		
Size	2/PA1, 2 space	2/S, 2 S	1/AH1, 1 ;	1/I3, 1 #	1/E1, 1 E	1/Z 1 Z			
Sketch	2/PA1, 2 space	2/S, 2 S	2/K, 2 K	1/EH1, 1 3	1/I3, 1 #	1/T, 1 T	1/CH 1 C		
Slow	2/PA1, 2 space	2/S, 2 S	2/L, 2 L	1/UH3, 1 8	1/01, 1 0	1/U1 1 U			
Sort	2/PA1, 2 space	2/S, 2 S	1/0, 1 \	1/R, 1 R	1/T 1 T				
Sound	2/PA1, 2 space	2/S, 2 S	1/AH1, 1 ;	1/UH3, 1 8	1/U1, 1 U	1/N, 1 N	1/D 1 D		
South	2/PA1, 2 space	2/S, 2 S	1/AH1, 1 ;	1/02, 1 [	1/U1, 1 U	1/TH 1 =			
Speaker	2/PA1, 2 space	2/S, 2 S	2/P, 2 P	1/E, 1 .	1/K, 1 K	1/ER 1 /			
Specific	1/PA1, 1 space	1/S, 1 S	1/EH2, 1 4	2/S, 2 S	1/I1, 1 I	1/F, 1 F	1/I3, 1 #	1/K 1 K	
Speed	2/PA1, 2 space	2/S, 2 S	2/P, 2 P	1/E1, 1 E	1/E1, 1 E	1/D 1 D			
Spend	2/PA1, 2 space	2/S, 2 S	2/P, 2 P	1/EH1, 1 3	1/I3, 1 #	1/N, 1 N	1/D 1 D		
Spring	2/PA1, 2 space	2/S, 2 S	2/P, 2 P	1/R, 1 R	1/I1, 1 I	1/NG 1 +			
Square	1/PA1, 1 space	1/S, 1 S	2/K, 2 K	2/W, 2 W	1/EH3, 1 5	1/I3, 1 #	1/R 1 R		
Stamp	2/PA1, 2 space	2/S, 2 S	2/T, 2 T	1/AE1, 1 9	1/EH3, 1 5	1/M, 1 M	1/P 1 P		

Standard	2/PA1, 2 space	2/S, 2 S	3/T, 3 T	1/AE1, 1 9	1/EH3, 1 5	1/N, 1 N	1/D, 1 D	1/ER, 1 /	1/D 1 D
State(s)	2/PA1, 2 space	2/S, 2 S	2/T, 2 T	1/A1, 1 @	1/AY, 1 *	1/Y1, 1 Y	1/T, 1 T	(1/S) (1 S)	
Statement	2/PA1, 2 space	2/S, 2 S	3/T, 3 T	1/A1, 1 @	1/AY, 1 *	2/T, 2 T	1/M, 1 M	1/EH3, 1 5	1/N, 1 N
	1/T 1 T								
Station	2/PA1, 2 space	2/S, 2 S	1/T, 1 T	2/A1, 2 @	1/AY, 1 *	1/SH, 1 >	1/UH3, 1 8	1/N 1 N	
Statistics	2/PA1, 2 space	1/S, 1 S	1/T, 1 T	1/EH2, 1 4	3/T, 3 T	2/I1, 2 I	1/S, 1 S	1/T, 1 T	1/I3, 1 #
	1/K, 1 K	1/S 1 S							
Stock	2/PA1, 2 space	2/S, 2 S	2/T, 2 T	1/AH1, 1 ;	1/AW2, 1 2	1/K 1 K			
Stop	2/PA1, 2 space	2/S, 2 S	2/T, 2 T	1/AH, 1]	1/UH3, 1 8	1/P 1 P			
Store	2/PA1, 2 space	2/S, 2 S	2/T, 2 T	1/0, 1 \	1/R 1 R				
Subject	2/PA1, 2 space	2/S, 2 S	2/UH1, 2 6	1/B, 1 B	1/D, 1 D	1/J, 1 J	1/EH1, 1 3	1/K, 1 K	1/T 1 T
Subjective	2/PA1, 2 space	1/S, 1 S	1/UH2, 1 7	2/B, 2 B	3/D, 3 D	2/J, 2 J	2/EH1, 2 3	1/K, 1 K	1/T, 1 T
	1/I3, 1 #	1/V 1 V							
Substitute	2/PA1, 2 space	2/S, 2 S	1/UH1, 1 6	1/B, 1 B	2/S, 2 S	1/T, 1 T	1/EH3, 1 5	1/T, 1 T	1/IU, 1 (
	1/U1, 1 U	1/T 1 T							
Success	2/PA1, 2 space	1/S, 1 S	1/UH2, 1 7	2/K, 2 K	2/S, 2 S	1/EH1, 1 3	1/S 1 S		
Such	2/PA1, 2 space	2/S, 2 S	1/UH, 1 6	1/T, 1 T	1/CH 1 C				
Sufficient	1/PA1, 1 space	1/S, 1 S	1/UH2, 1 7	3/F, 3 F	1/I1, 1 I	1/SH, 1 >	1/EH3, 1 5	1/N, 1 N	1/T 1 T

Suggest	1/PA1, 1 space	1/S, 1 S	1/UH2, 1 7	2/G, 2 G	2/D, 2 D	2/J, 2 J	1/EH, 1 3	1/S, 1 S	1/T 1 T
Sunday	2/PA1, 2 space	2/S, 2 S	2/UH1, 2 6	1/N, 1 N	2/N, 2 N	1/D, 1 D	1/A2, 1)	1/AY 1 @	
Supply	2/PA1, 2 space	1/S, 1 S	1/UH2, 1 7	2/P, 2 P	2/L, 2 L	1/AH1, 1 ;	1/E1 1 E		
Support	2/PA1, 2 space	1/S, 1 S	1/UH2, 1 7	2/P, 2 P	1/0, 1 \	1/R, 1 R	1/T 1 T		
Surplus	2/PA1, 2 space	2/S, 2 S	2/ER, 2 /	1/P, 1 P	1/L, 1 L	1/UH2, 1 7	1/S 1 S		
Taught	1/PA1, 1 space	3/T, 3 T	1/AW, 1 ,‡	1/T 1 T					
Teacher	2/PA1, 2 space	2/T, 2 T	1/E1, 1 E	1/T, 1 T	1/CH, 1 C	1/ER 1 /			
Technical	2/PA1, 2 space	1/T, 1 T	2/EH1, 2 3	1/K, 1 K	1/N, 1 N	1/I3, 1 #	1/K, 1 K	1/UH3, 1 8	1/L 1 L
Technique	1/PA1, 1 space	1/T, 1 T	1/EH1, 1 3	2/K, 2 K	1/N, 1 N	1/E, 1 .	1/K 1 K		
Telephone	2/PA1, 2 space	2/T, 2 T	2/EH1, 2 3	1/L, 1 L	2/UH3, 2 8	1/F, 1 F	1/01, 1 0	1/U1, 1 U	1/N 1 N
Television	2/PA1, 2 space	2/T, 2 T	2/EH1, 2 3	1/L, 1 L	2/UH3, 2 8	1/V, 1 V	1/I2, 1 !	1/ZH, 1 X	1/UH3, 1 8
	1/N 1 N								
Ten	2/PA1, 2 space	2/T, 2 T	2/EH3, 2 5	1/EH1, 1 3	1/N 1 N				
Terminate	2/PA1, 2 space	2/T, 2 T	2/ER, 2 /	1/M, 1 M	1/I3, 1 #	1/N, 1 N	1/A2, 1)	1/Y1, 1 Y	1/T 1 T
Test	2/PA1, 2 space	2/T, 2 T	1/EH, 1 3	1/S, 1 S	1/T 1 T				
That	2/PA1, 2 space	2/THV, 2 <	1/AE1, 1 9	1/EH3, 1 5	1/T 1 T				
The	2/PA1, 2 space	1/THV, 1 <	1/UH3, 1 8	2/UH3, 2 8	3/UH3 2 8				

‡ When using the INPUT statement, this character must be shifted.

Them	2/PA1, 2 space	2/THV, 2 <	1/EH1, 1 3	1/EH3, 1 5	1/M 1 M				
Then	2/PA1, 2 space	2/THV, 2 <	1/EH1, 1 3	1/EH3, 1 5	1/N 1 N				
There	2/PA1, 2 space	2/THV, 2 <	1/EH2, 1 4	1/A2, 1)	1/R 1 R				
These	2/PA1, 2 space	2/THV, 2 <	1/E1, 1 E	1/E1, 1 E	1/Z 1 Z				
Third	2/PA1, 2 space	1/TH, 2 =	1/ER, 1 /	1/R, 1 R	1/D 1 D				
Thirteen	2/PA1, 2 space	3/TH, 3 =	1/R, 1 R	2/ER, 2 /	2/T, 2 T	2/PA0, 2 0	1/E1, 1 E	1/E1, 1 E	1/N 1 N
This	2/PA1, 2 space	1/THV, 1 <	2/I, 2 ”	1/S 1 S					
Three	2/PA1, 2 space	2/TH, 2 =	2/R, 2 R	1/E1, 1 E	1/Y 1 &				
Thursday	2/PA1, 2 space	2/TH, 2 =	2/TH, 2 =	2/ER, 2 /	1/R, 1 R	2/Z, 2 Z	1/D 1 D	1/A1, 1 @	1/AY 1 *
Time	2/PA1, 2 space	2/T, 2 T	1/AH1, 1 ;	1/E1, 1 E	1/M 1 M				
To	2/PA1, 2 space	2/T, 2 T	1/IU, 1 (	1/U 1 ’					
Topic	2/PA1, 2 space	2/T, 2 T	1/AH1, 1 ;	1/P, 1 P	1/I3, 1 #	1/K 1 K			
Touch	2/PA1, 2 space	2/T, 2 T	1/UH, 1 6	1/T, 1 T	1/CH 1 C				
Traffic	2/PA1, 2 space	2/T, 2 T	2/R, 2 R	1/AE1, 1 9	1/EH3, 1 5	1/F, 1 F	1/I3, 1 #	1/K 1 K	
Transaction	2/PA1, 1/SH, 2 space 1 >	1/T, 1/UH3, 1 T 1 8	1/R, 1/N 1 R 1 N	1/AE1, 1 9	2/N, 2 N	3/Z, 3 Z	1/AE1, 1 9	2/EH3, 2 5	1/K, 1 K
Transfer	2/PA1, 2 space	2/T, 2 T	2/R, 2 R	1/AE1, 1 9	2/I3, 2 #	1/N, 1 N	2/S, 2 S	1/F, 1 F	1/ER 1 /
Tuesday	2/PA1, 2 space	2/T, 2 T	1/IU, 1 (	2/U1, 2 U	1/U1, 1 U	2/Z, 2 Z	1/D, 1 D	1/A1, 1 @	1/AY 1 *

Unconscious	1/PA1, 1 space	1/UH2, 1 7	1/N, 1 N	2/K, 2 K	2/AH1, 2 ;	1/N, 1 N	1/SH, 1 >	1/UH3, 1 8	1/S 1 S
Understand	1/PA1, 1 space	1/UH2, 1 7	2/N, 2 N	1/D, 1 D	1/R, 1 R	2/S, 2 S	2/T, 2 T	1/AE1, 1 9	1/EH3, 1 5
	1/N, 1 N	1/D 1 D							
Understood	1/PA1, 1 space	1/UH2, 1 7	2/N, 2 N	1/D, 1 D	1/R, 1 R	2/S, 2 S	2/T, 2 T	1/IU, 1 (	1/IU, 1 (
	1/D 1 D								
Uniform	2/PA1, 2 space	2/Y, 2 &	1/IU, 1 (	1/U1, 1 I	1/N, 1 N	2/UH3, 2 8	1/F, 1 F	1/01, 1 0	1/R, 1 R
	1/M 1 M								
Unite	1/PA1, 1 space	1/Y1, 1 Y	1/IU, 1 (	2/U1, 2 U	2/N, 2 N	1/AH1, 1 ;	1/Y1, 1 Y	1/T 1 T	
Unknown	1/PA1, 1 space	1/UH2, 1 7	1/N, 1 N	3/N, 3 N	1/UH3, 1 8	1/01, 1 0	1/U1, 1 U	1/N 1 N	
Unlimited	1/PA1, 1 space	1/UH2, 1 7	2/N, 2 N	2/L, 2 L	2/I2, 2 !	1/M, 1 M	1/I3, 1 #	1/T, 1 T	1/I3, 1 #
	1/D 1 D								
Until	1/PA1, 1 space	1/UH2, 1 7	1/N, 1 N	2/T, 2 T	2/I1, 2 I	1/UH3, 1 8	1/L 1 L		
Unusual	1/PA1, 1/L	1/UH2,	1/N,	2/Y1,	1/IU,	2/U1,	1/ZH,	1/IU,	1/U1,
	1/UH3,	1 space 1 L	1 7	1 N	2 Y	1 (	2 U	1 X	1 (
	1 U	1 8							
Upon	1/PA1, 1 space	1/UH1, 1 6	3/P, 3 P	1/AH1, 1 ;	1/UH3, 1 8	1/N 1 N			
Urgent	2/PA1, 2 space	2/R, 2 R	1/R, 1 R	1/D, 1 D	1/J, 1 J	1/EH2, 1 4	1/N, 1 N	1/T 1 T	
Use *	2/PA1, 2 space	2/Y1, 2 Y	1/IU, 1 (	1/U, 1 '	1/S 1 S				

Use *	2/PA1, 2 space	1/Y1, 1 Y	1/IU, 1 (	1/U, 1 U	1/Z 1 Z				
Vacancy	2/PA1, 2 space	2/V, 2 V	2/A1, 2 @	1/AY, 1 *	1/K, 1 K	1/EH3, 1 5	1/N, 1 N	1/S, 1 S	1/Y 1 &
Valid	1/PA1, 1 space	2/V, 2 V	1/AE1, 1 9	1/UH3, 1 8	1/L, 1 L	1/UH3, 1 8	1/D 1 D		
Verify	2/PA1, 2 space	2/V, 2 V	1/EH1, 1 3	1/R, 1 R	1/EH3, 1 3	1/F, 1 F	1/AH1, 1 ;	1/E1 1 E	
Very	2/PA1, 2 space	2/V, 2 V	1/EH, 1 3	1/R, 1 R	1/Y 1 &				
Voice	2/PA1, 2 space	2/V, 2 V	1/01, 1 0	1/UH3, 1 8	1/E1, 1 E	1/S 1 S			
Volume	2/PA1, 2 space	2/V, 2 V	1/AH1, 1 ;	1/L, 1 L	1/Y1, 1 Y	1/U1, 1 U	1/M 1 M		
VOTRAX	2/PA1, 2 space	1/V, 1 V	1/0, 1 \	1/T, 1 T	1/R, 1 R	1/AE1, 1 9	1/EH3, 1 5	1/K, 1 K	1/S 1 S
Walk	2/PA1, 2 space	2/W, 2 W	1/AW, 1 ,‡	1/K 1 K					
Want	2/PA1, 2 space	2/W, 2 W	1/AH1, 1 ;	1/UH3, 1 8	1/N, 1 N	1/T 1 T			
Warehouse	2/PA1, 2 space	1/W, 1 W	2/EH1, 2 3	1/R, 1 R	1/H, 1 H	1/UH3, 18	1/AH2, 1 A	1/U1, 1 U	1/S 1 S
Watch	2/PA1, 2 space	2/W, 2 W	1/AW2, 1 2	1/AH1, 1 ;	1/T, 1 T	1/CH 1 C			
Wednesday	2/PA1, 2 space	2/W, 2 W	1/EH1, 1 3	2/N, 2 N	1/Z, 1 Z	1/D, 1 D	1/A1, 1 @	1/AY 1 *	
Weigh(t)	2/PA1, 2 space	2/W, 2 W	1/EH3, 1 5	1/A2, 1)	1/AY, 1 *	1/Y1, 1 Y	(1/T) (1 T)		
Welcome	2/PA1, 2 space	2/W, 2 W	1/EH1, 1 3	2/L, 2 L	1/K, 1 K	1/UH1, 1 6	1/M 1 M		
Well	2/PA1, 2 space	2/S, 2 S	1/EH1, 1 3	1/UH3, 1 8	1/L 1 L				
Went	2/PA1, 2 space	2/W, 2 W	1/EH1, 1 3	1/N, 1 N	1/T 1 T				

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Were	2/PA1,	2/W,	1/ER,	1/R			
	2 space	2 W	1 /	1 R			
West	2/PA1,	1/W,	2/EH1,	1/S,	1/T		
	2 space	1 W	2 3	1 S	1 T		
What	1/PA1,	1/W,	2/UH1,	1/T			
	1 space	1 W	2 6	1 T			
When	1/PA1,	1/W,	2/EH1,	1/N			
	1 space	1 W	2 3	1 N			
Where	2/PA1,	1/W,	2/EH2,	1/A2,	1/R		
	2 space	1 W	2 4	1)	1 R		
Which	1/PA1,	2/W,	2/I1,	1/T,	1/CH		
	1 space	2 W	2 I	1 T	1 C		
White	2/PA1,	1/W,	2/UH3,	1/AH2,	1/E1,	1/T	
	2 space	1 W	2 8	1 A	1 E	1 T	
Why	1/PA1,	2/W,	2/UH3,	1/AH1,	1/E1		
	1 space	2 W	2 8	1 ;	1 E		
Will	2/PA1,	2/W,	1/I2,	1/UH3,	1/L		
	2 space	2 W	1 !	1 8	1 L		
Wind *	2/PA1,	2/W,	1/AH1,	1/E1,	1/N,	1/D	
	2 space	2 W	1 ;	1 E	1 N	1 D	
Wind *	2/PA1,	2/W,	1/I1,	1/N,	1/D		
	2 space	2 W	1 I	1 N	1 D		
Within	1/PA1,	2/W,	1/I2,	2/TH,	3/I2,	1/I3,	1/N
	1 space	2 W	1 !	2 =	3 !	1 #	1 N
Without	1/PA1,	2/W,	1/I2,	2/TH,	3/UH3,	1/AH2,	1/U1, 1/T
	1 space	2 W	1 !	2 =	3 8	1 A	1 U 1 T
Work	1/PA1,	1/W,	1/ER,	2/R,	2/K		
	1 space	1 W	1 /	2 R	2 K		
Would	1/PA1,	2/W,	1/U1,	1/IU,	1/IU,	1/D	
	1 space	2 W	1 U	1 (	1 (	1 D	
Wound *	1/PA1,	2/W,	2/UH3,	1/AH1,	1/U1,	1/N,	1/D
	1 space	2 W	2 8	1 ;	1 U	1 N	1 D
Wound *	1/PA1,	2/W,	1/U1,	1/U1,	1/N,	1/D	
	1 space	2 W	1 U	1 U	1 N	1 D	
Wrap	1/PA1,	2/R,	1/AE1,	1/EH3,	1/P		
	1 space	2 R	1 9	1 5	1 P		

X-Ray	2/PA1, 2 space	2/EH3, 2 5	2/K, 2 K	1/S, 1 S	1/R, 1 R	1/AY, 1 *	1/AY 1 *		
Yes	1/PA1, 1 space	2/Y, 2 &	1/EH1, 1 3	1/EH3, 1 5	1/S 1 S				
Yesterday	1/PA1, 1 space	2/Y, 2 &	2/EH1, 2 3	2/S, 2 S	1/T, 1 T	1/R, 1 R	1/D, 1 D	1/A1, 1 @	1/AY 1 *
You	2/PA1, 2 space	2/Y, 2 &	1/IU, 1 (	1/U 1 '					
Zero	2/PA1, 2 space	2/Z, 2 Z	1/I1, 1 I	1/R, 1 R	1/UH3, 1 8	1/01 1 0			
Zone	2/PA1, 2 space	2/Z, 2 Z	2/UH3, 2 8	1/01, 1 0	1/U1, 1 U	1/N 1 N			

Appendix C

NOTES

1. This list consists primarily of verbs, adverbs and adjectives found with some frequency in spoken English. Those nouns included were selected due to their frequency of occurrence, but may not be adequate to accommodate the vocabulary needs of any one specific environment.

2. In general, single syllable words—those words containing only one vowel sound with or without consonant sounds—are to be considered of low intelligibility when presented in isolation. Words like CODE, EIGHT, LIFE, SELF, GUESS are included in this category. Even though they are recognizable out of context, their intelligibility is enhanced when used in context, as it would be with a human speaker. Words like BE, A, THE, OF, IS (open-ended single syllable words) are, by the nature of spoken English, short in duration and take on characteristics to enhance the word(s) they modify. Often, this may require a change in their pronunciation to accommodate the rhythm and accent of the contextual flow. Thus, these words are low in intelligibility when presented in isolation. When words are selected, it is recommended that single syllable words be given the advantage of a contextual environment for maximizing their intelligibility, whenever possible.

3. The Asterisk (*) following certain words indicate that there is more than one pronunciation for that spelling or more than one meaning for that spelling.

4. The following list is made up of words *not* found on the 500 list, but whose programs are. (Followed by their location word)

accept	(except)
ate	(eight)
awl	(all)
"B"	(be)
bee	(be)
buy	(by)
bye	(by)
"C"	(see)
cell	(sell)

cent	(sent)
dew	(do)
due	(do)
eye	("I")
fore	(for)
forth	(fourth)
four	(for)
grate	(great)
hart	(heart)
herd	(heard)
here	(hear)
hi	(high)
higher	(hire)
hour(s)	(our(s))
Inn	(in)
knot	(not)
leased	(least)
maid	(made)
no	(know)
new	(knew)
"R"	(are)
rap	(wrap)
red	(read (*))
reed	(read (*))
rite	(right)
scene	(seen)
sea	(see)
sense	(cents)
sine	(sigh)
their	(there)
they're	(there)
too	(to)
two	(to)
"U"	(you)
wait	(weigh(t))
way	(weigh(t))
wear	(where)
witch	(which)
wood	(would)
wright	(right)
write	(right)
won	(one)
"Y"	(why)

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